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ATC-2002WF

802.11gb Wireless LAN to Dual-Port RS232 Serial Server

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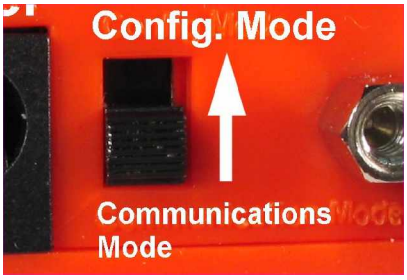
Quick Start 1 - READ THIS!

Things You Need to Know That are Not Obvious:
This section explains what the Switch, LEDs, etc. do.

1 "Configuration" switch: The slide switch located on the rear of the Serial Server must be switched "**up**" to the "**Config. Mode**" to use the **Set Up Utility. This switch is used to enable the Configuration process irrespective of whether the configuration is done with USB, the COM ports or over-the-air.**



Likewise to "**Run" the Serial device**, the switch must be set **downward** to the "**Communications Mode**" position.

2 "USB Port": The USB port is used only for configuration, and **when the USB cable is plugged in it will borrow the RS232 signals from the COM1 port**. So **when configuration is completed, the USB cable MUST be removed for COM1 to function properly**.

3 "Power" It is recommended to also **use the power supply when configuring the Serial Device** instead of relying solely on the USB cable to provide power. Laptops in particular are stingy with restricting power available from the Laptop USB port.

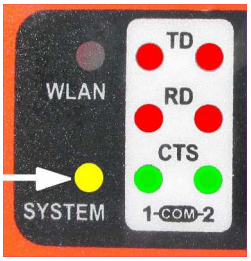
4 What the LEDs indicate:

4a. When you apply Power…:
The two **Td** RS232 output LEDs Turn ON immediately displaying Red.

4b "System" LED indicator:

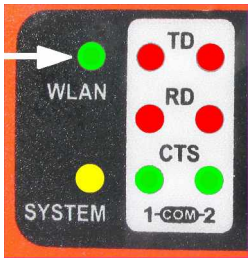
4b1 If **System LED is OFF** then the Serial Device is initializing or other task and is NOT monitoring Wireless LAN activity.

4b2 If **System LED is Flashing**, the Serial Device is in "Set Up Mode" and the "Config. Switch" at the rear of the device is in the "UP" "Config" position" and is NOT monitoring Wireless LAN activity.



4b3 If **System LED is solidly Yellow color**, the Serial device has initialized and is **monitoring Wireless LAN activity**.

4c WLAN LED:
As wireless LAN activity is passing either to or from the Serial Device, the **Green WLAN LED will briefly flash to indicate wireless data activity during each burst of data transfer.**



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More Quick Start 2 - READ THIS TOO!

More Things You Need to Know That are Not Obvious:

This section explains the basics of Starting Configuration.

To configure the Serial Device:

1 Load the Set UP Utility from the CD, It should auto-install upon inserting CD to a PC.

2 Plug in the Power Supply into the Power Jack. (You may not need the power supply to configure the Serial Device since there may be enough power available from the USB port to power the Serial Device. Laptops may limit the power available at the USB so a power supply may be necessary.)

3 Plug in the USB cable into the Serial Device and PC. The computer should audibly chime to indicate a USB device has been plugged in. If it does not automatically associate the new USB Serial Device with the Set UP Utility then use the Browse function to direct the USB Set Up to the CD drive to locate the Drivers and Set Up Utility for the Serial Device. (Note: You may also use the PC Serial Ports to configure or it can Configure over-the-air with a radio link.)

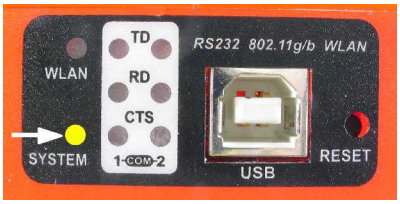
4 Flip the Switch on the rear panel **UP to "Config. Mode."**

IMPORTANT NOTE:

When you are configuring the Serial Device, flipping the switch to Config Mode will take the RS232 signals away from COM1 port, since the USB borrows the COM 1 channel temporarily for Configuration.

So it is very important when Configuration is complete to flip this switch back down to the "Communications Mode" to run.

When in **Configuration Mode**, the **Amber (yellow) color "SYSTEM" LED with *flash* to indicate that this is Configuration mode**. **You MUST wait until this LED begins to flash to read or alter the configuration settings.**



5 When finished with Configuration, the **flashing Yellow System LED warns you to flip the Configuration switch DOWN** to the "Communications (RUN) Mode" and the System LED will then remain solidly illuminated.

6 **Remove the USB cable** used to set up the Serial Server. **COM 1 will not function properly as an RS232 port with the USB cable also plugged in**.

Remember that the USB cable borrows the COM 1 port for configuration, so the USB cable must be removed to restore COM1 to RS232 activity.

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FCC Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--- Reorient or relocate the receiving antenna.
--- Increase the separation between the equipment and receiver.
--- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
To maintain compliance with FCC RF exposure compliance requirements, please avoid direct contact to the transmitting antenna during transmitting.

INFORMATION TO USER:

The User Manual or Instruction Manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party

responsible for compliance could void the user's authority to operate the equipment.

CAUTION: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Prohibition of co-location

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

MPE Statement (Safety Information)

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference in which rack the user may be required to take adequate measures.

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1. Introduction

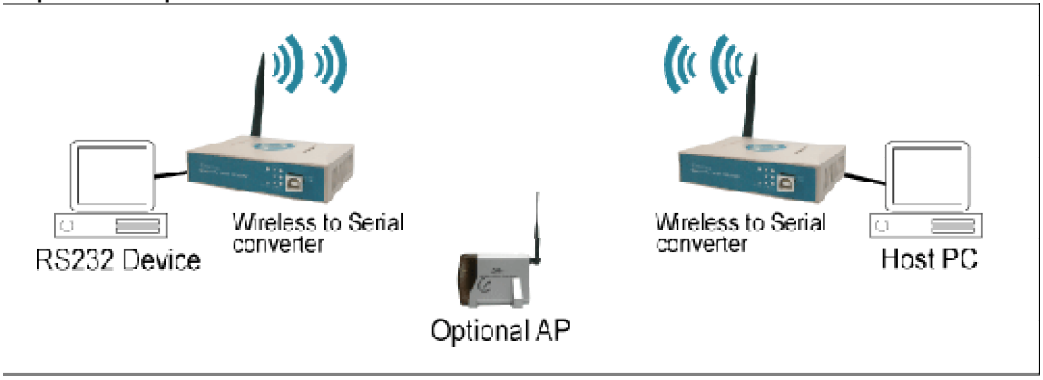
The RS232 connection application has used for a long time. RS232 cable has limitations in distance. WLAN (Wireless Local Area Network) has become a worldwide standard protocol for wireless applications. There are many applications for using RS232 connection over WLAN, including POS, data capture, telemetry, PLC controllers, remote control, vending machine, industrial control, and others. The device that supports connection over WLAN is called as Wireless to Serial Server.

Throughout the guide, the **802.11g Wireless to Serial Server** will be referred as **the "Server"**.

1.1 802.11g Wireless to Serial Server Application

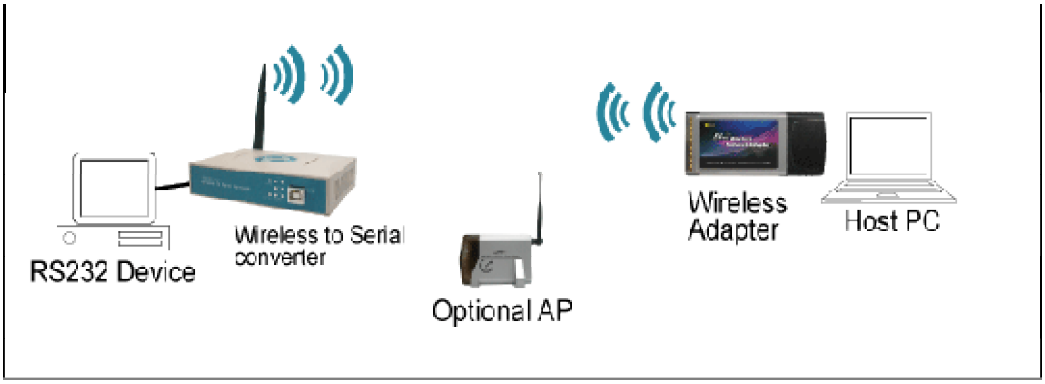
Peer to Peer

The host PC and an RS232 device communicate with each other via the individual converter. The access point is optional.



Converter to PC WLAN

The RS232 device is connected to the converter, and the PC is equipped with the wireless card. Two sides communicate through the converter and wireless card. The access point is optional.



Converter to Access Point

The RS232 device is connected to the converter, the host PC is connected to the access point via LAN.

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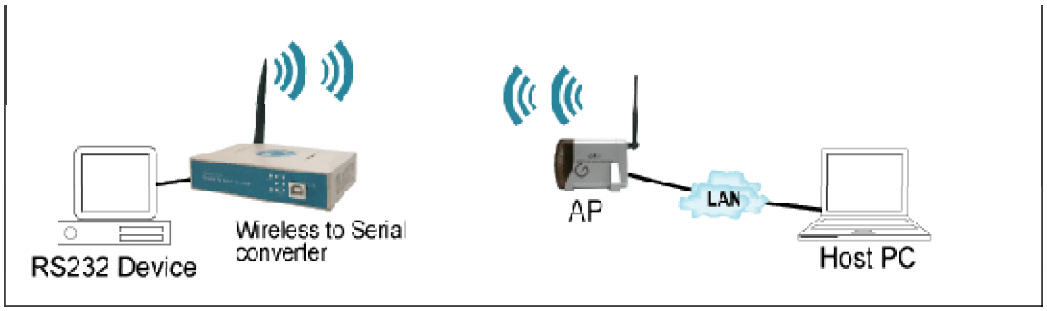
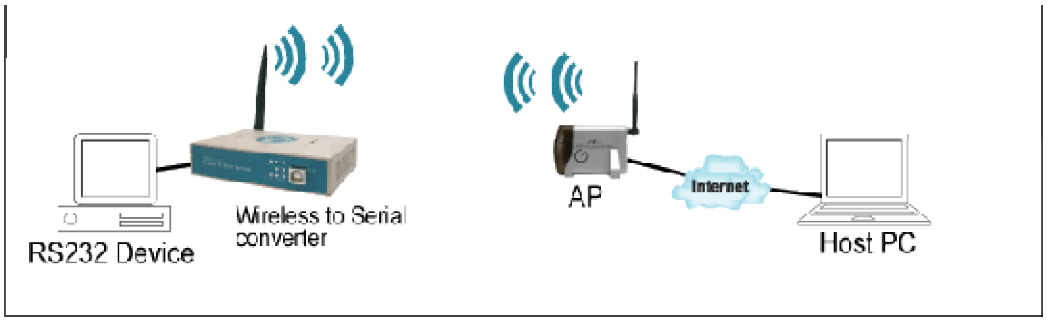


Converter over the Internet

The application is used for far end remote communication via the Internet.



Note: For environments requirement, applications listed above might require the 802.11x protocol and proprietary IP (or TCP/IP) protocol.

1.2 Package Content

- One 802.11g Wireless to Serial Server
- One Removable Antenna (RP-SMA) (“Reverse Polarity – SMA”)
- One CD (containing Set Up Utility, User Manual and various Application Notes)
- One AC Power Adapter with DC barrel plug (2.1mm ID, 5.5mm OD)
- One USB MF cable

2. Getting to Know 802.11g Wireless To Serial Server

Generally, the access point is better to place at the center of all the WLAN stations, to know the converter, please read the description.

2.1 Front Panel

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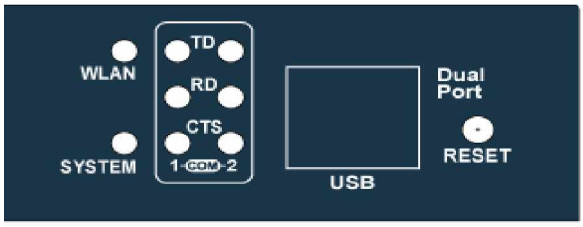

LED Indication

WLAN *Blinks green* to indicate data is transmitting and receiving.

SYSTEM *Off* to indicate system is in initial status and the converter not ready to operate.
Lights yellow to indicate system is in communication mode.
Blinks to indicate system is in configuration mode.

TD *Lights red* to indicate the converter is power on.
Blinks green to indicate the converter is transferring data to RS232 device.

RD *Lights red* to indicate the cable is connected.
Blinks green to indicate the converter is receiving data from RS232 device.

CTS *Blinks green* to indicate the converter is transmitting CTS signal.

Note: TD, RD, and CTS LED are explained for COM 1 and COM 2 port.

Port Definition

USB Port Plug in the USB (B-type female) into the USB port.

RESET Press reset bottom at once to reset the system. Press reset bottom for 5 seconds to reset to default setting.

2.2 Rear Panel

POWER Plug in the power adapter of 12V DC/1A into the power port.

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Configuration Switch

"Config Mode": Moving the switch up to Config Mode will allow the User to configure the Server using the Set Up Utility software.

"Communication Mode": This is the "RUN" mode that allows the Server to wirelessly transmit data and receive data over the wireless network.

COM 1 COM 1 port is used as DTE mode male connector. It is wired about the same as the male serial COM port connector on a PC. To connect a PC to the Server COM 1 use a cable with 2 female connectors with NULL crosses on pins 2&3, 4&6, 7&8 with pin 5 to pin 5.

COM 2 COM 2 port is used as DCE mode female connector. Connect PC To the Server COM 2 (female port) port by using an RS232 Straight (no crossed wires) male/female cable.

Note:

1. USB port shares with COM 1 port and the priority of USB is higher than COM 1 port. As USB port is connected to the NB/PC, Server COM 1 port will be disabled.
2. When using USB port, power should be supplied to converter by power adapter not by the USB port alone. This is because the USB port might not receive adequate power from the USB port. This is especially true when using the Server for high power operations such as transmitting or writing to the Server internal Flash memory. Power starvation is especially of concern when the Server is connected to laptop PCs since laptops are especially restrictive limiting power available to the USB port.
3. RS232 connection restriction is as follow. 9-pin Male DE9 connector wired as **DTE** (Data Terminal Equipment) (like a PC). 9-pin Female DE9 connector wired as **DCE** (Data Communication Equipment) (like a Modem).

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3. Installation

To start the installation, please follow the steps.

1. Insert the CD into the CD-ROM.

2. Select the setup file: **setup.exe**. Click "**setup**" to run the program. The following dialogue will appear. Click "**Yes**" to continue.

3. As entering the welcome screen, click "**Next**" to continue.

Setup - 802.11g Wireless To Serial Converter
802.11g Wireless To Serial Converter
Setup
Welcome to the 802.11g Wireless To Serial Converter Setup Wizard
This will install Wireless To Serial Configuraton Converter Utility on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel
Copyright(R) 2005, Runtop

4. Enter the **User Name** and **Organization**.

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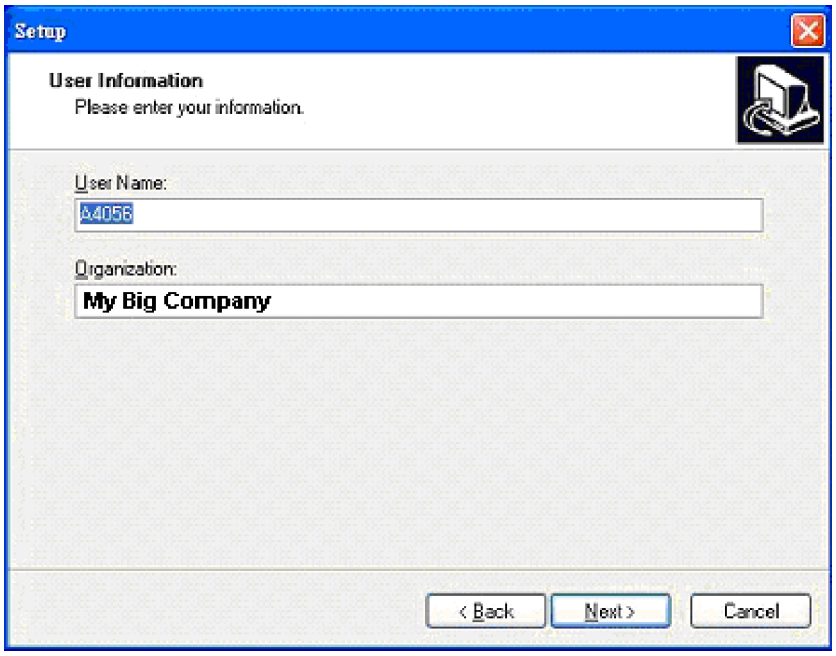
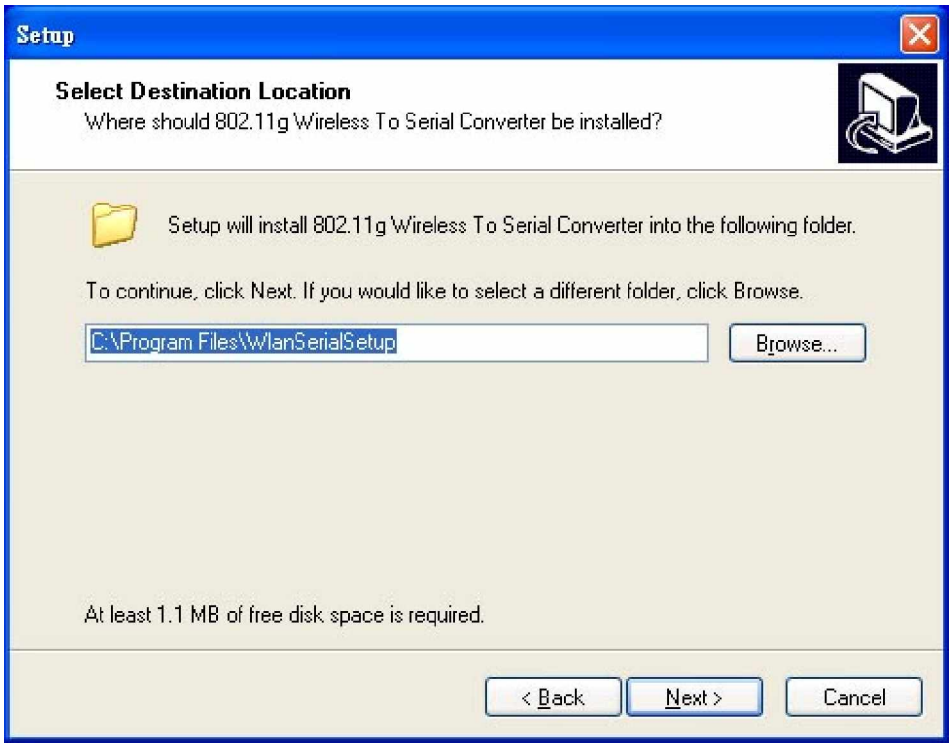


5. Select the folder for installing the 802.11g Wireless to Serial Server. Click **Browse** to choose the path.


Setup
Select Destination Location
Where should 802.11g Wireless To Serial Converter be installed?
Setup will install 802.11g Wireless To Serial Converter into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\WlanSerialSetup
Browse...
At least 1.1 MB of free disk space is required.
< Back
Next >
Cancel

6. Select the shortcut in the following Start Menu folder. Click **Browse** to choose the path.

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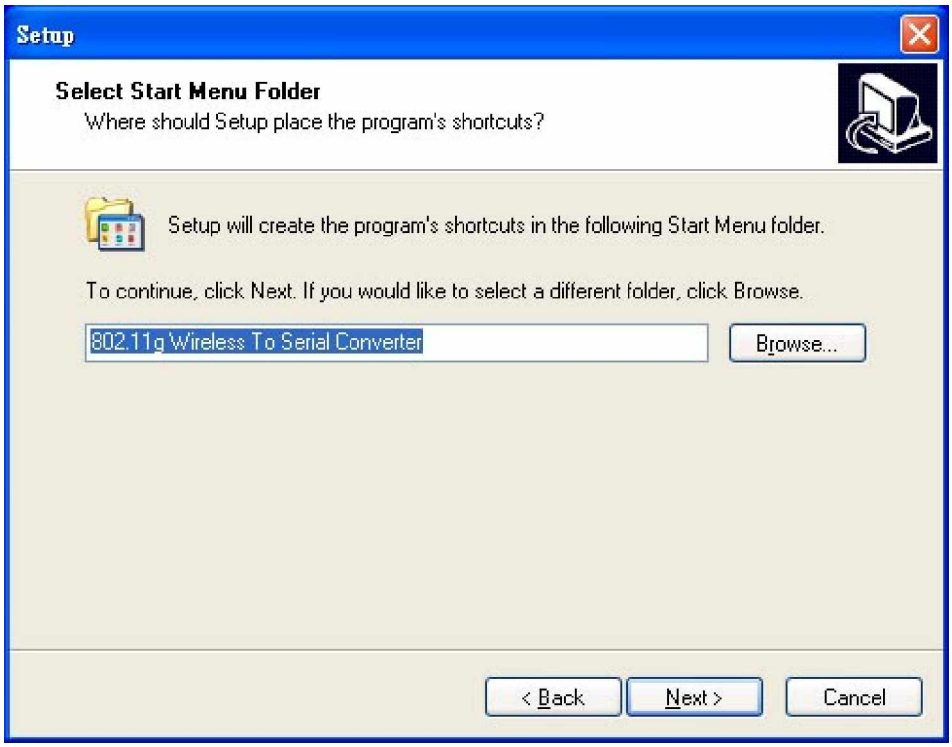
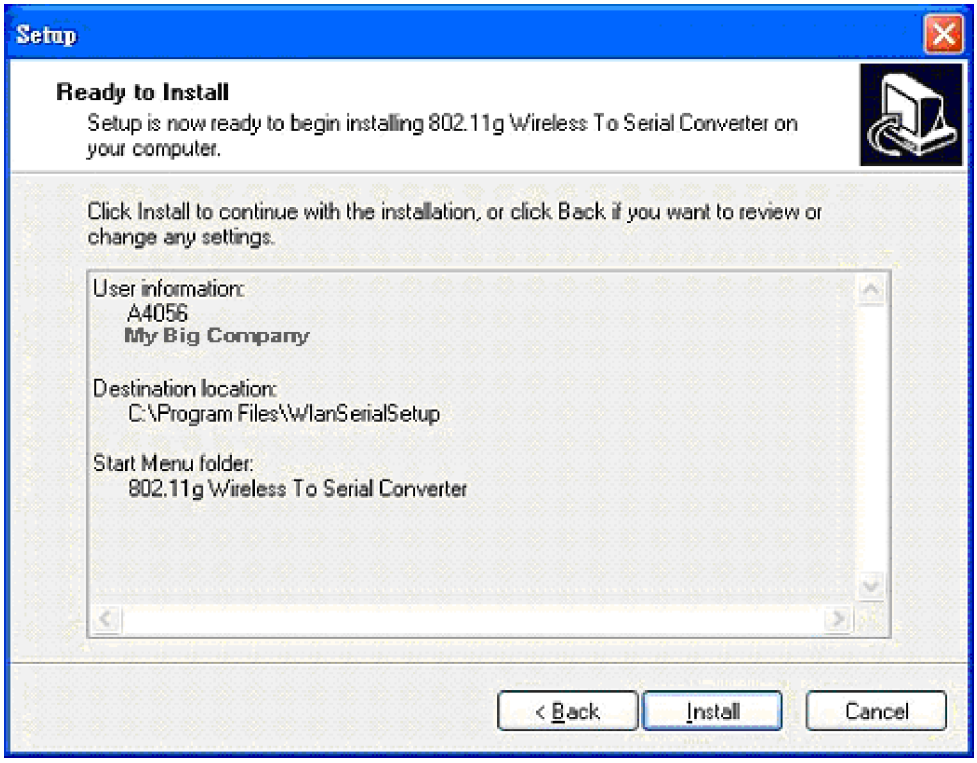

Setup
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
802.11g Wireless To Serial Converter
Browse...
< Back
Next >
Cancel

7. If you are ready to install, click **Install**.


Setup
Ready to Install
Setup is now ready to begin installing 802.11g Wireless To Serial Converter on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
User information:
A4056
My Big Company
Destination location:
C:\Program Files\WlanSerialSetup
Start Menu folder:
802.11g Wireless To Serial Converter
< Back
Install
Cancel

8. Click **Finish** to confirm the installation.

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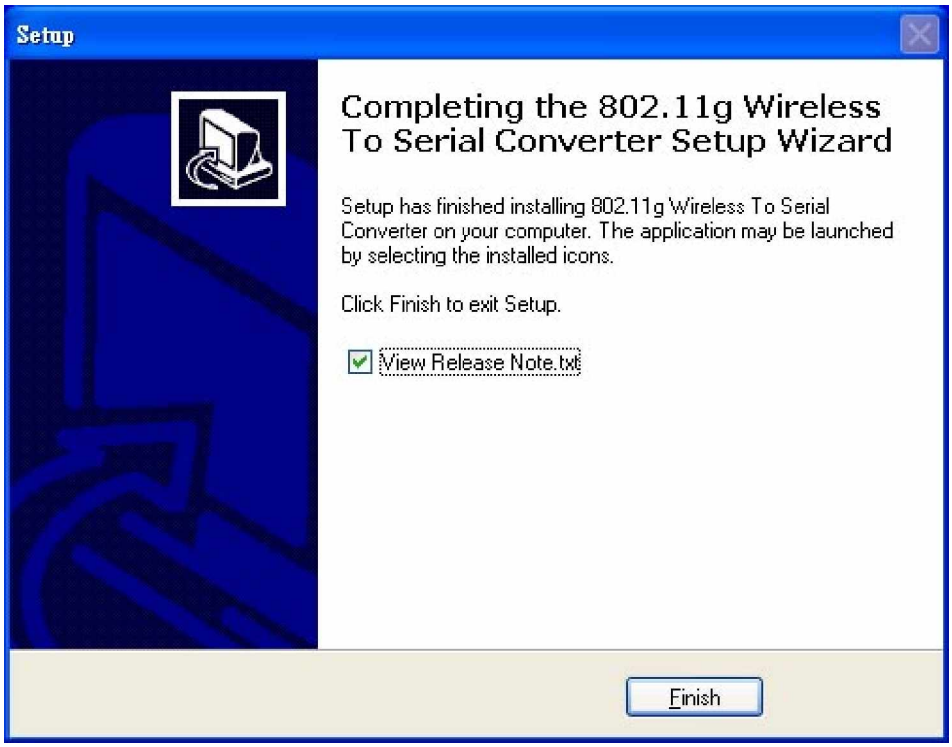
Setup
Completing the 802.11g Wireless To Serial Converter Setup Wizard
Setup has finished installing 802.11g Wireless To Serial Converter on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
View Release Note.txt
Finish

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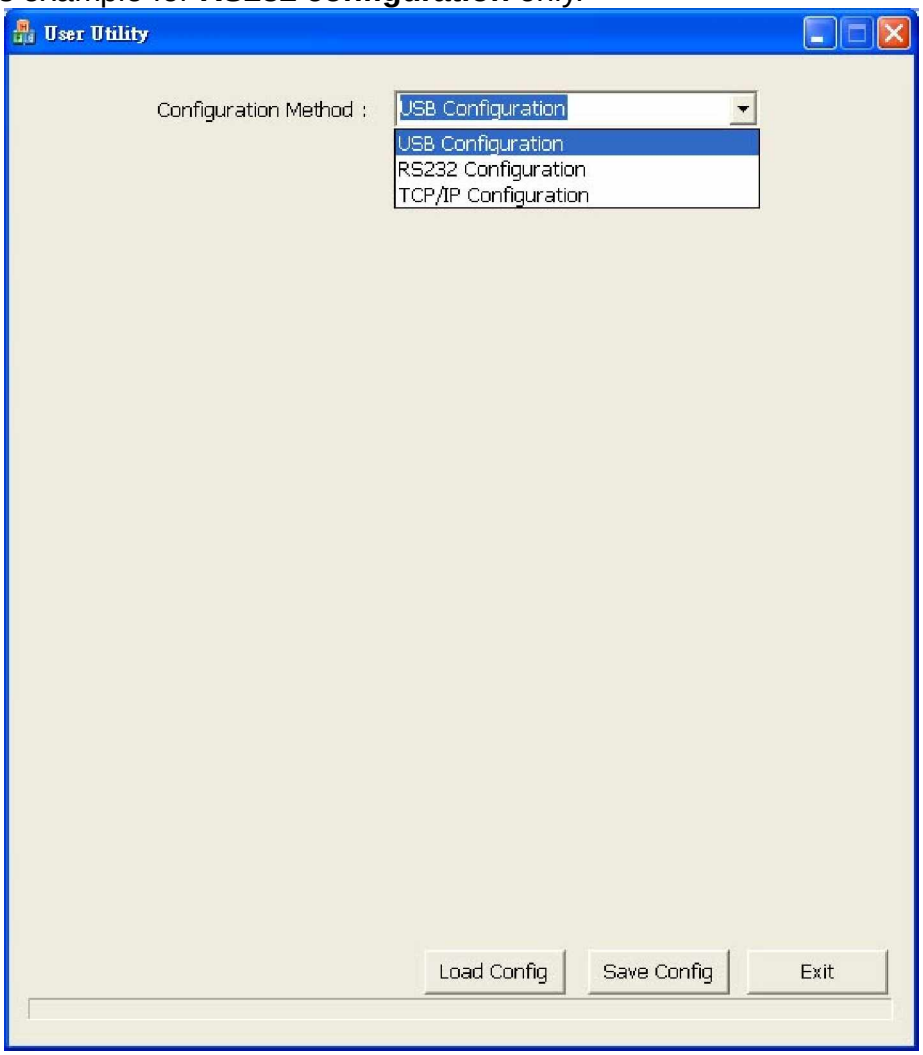
4. Configuration

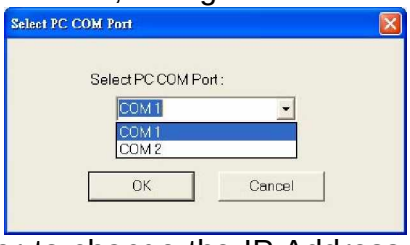
To configure the converter, as the **System LED** starts to *blink*, than go to ***Start*** à ***Program*** à ***802.11g Wireless to Serial Server*** à ***WlanSerialSetup***.

1. Select the configuration mode from: USB configuration, RS232 configuration, and TCP/IP configuration. Click **Load Config** to enter the configuration mode.

Note: Below is example for **RS232 configuration** only.



2. Before load the configuration, select the PC COM port first. Note that it is required to select the COM port of PC. Click **OK**, configuration will be loaded automatically.



3. Network section enables user to change the IP Address, IP Mask, and Gateway. To use

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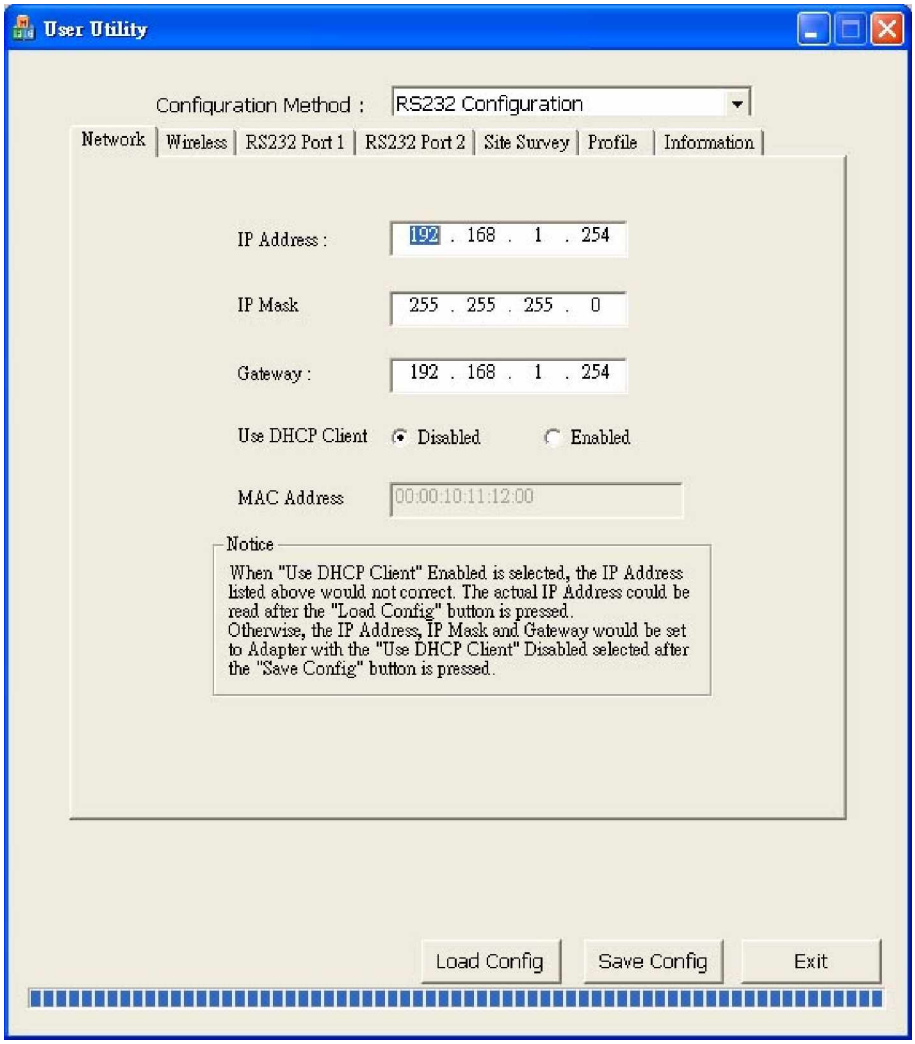
DHCP, pleas click “**Enable**”.


User Utility
Configuration Method :
RS232 Configuration
Network
Wireless
RS232 Port 1
RS232 Port 2
Site Survey
Profile
Information
IP Address :
192 . 168 . 1 . 254
IP Mask
255 . 255 . 255 . 0
Gateway :
192 . 168 . 1 . 254
Use DHCP Client
Disabled
Enabled
MAC Address
00:00:10:11:12:00
Notice
When "Use DHCP Client" Enabled is selected, the IP Address listed above would not correct. The actual IP Address could be read after the "Load Config" button is pressed.
Otherwise, the IP Address, IP Mask and Gateway would be set to Adapter with the "Use DHCP Client" Disabled selected after the "Save Config" button is pressed.
Load Config
Save Config
Exit

4. Wireless section enables user select the operation mode, channel, SSID, TX rate, and Encryption mode. To set the further WEP, enable the encryption function, and set the key.

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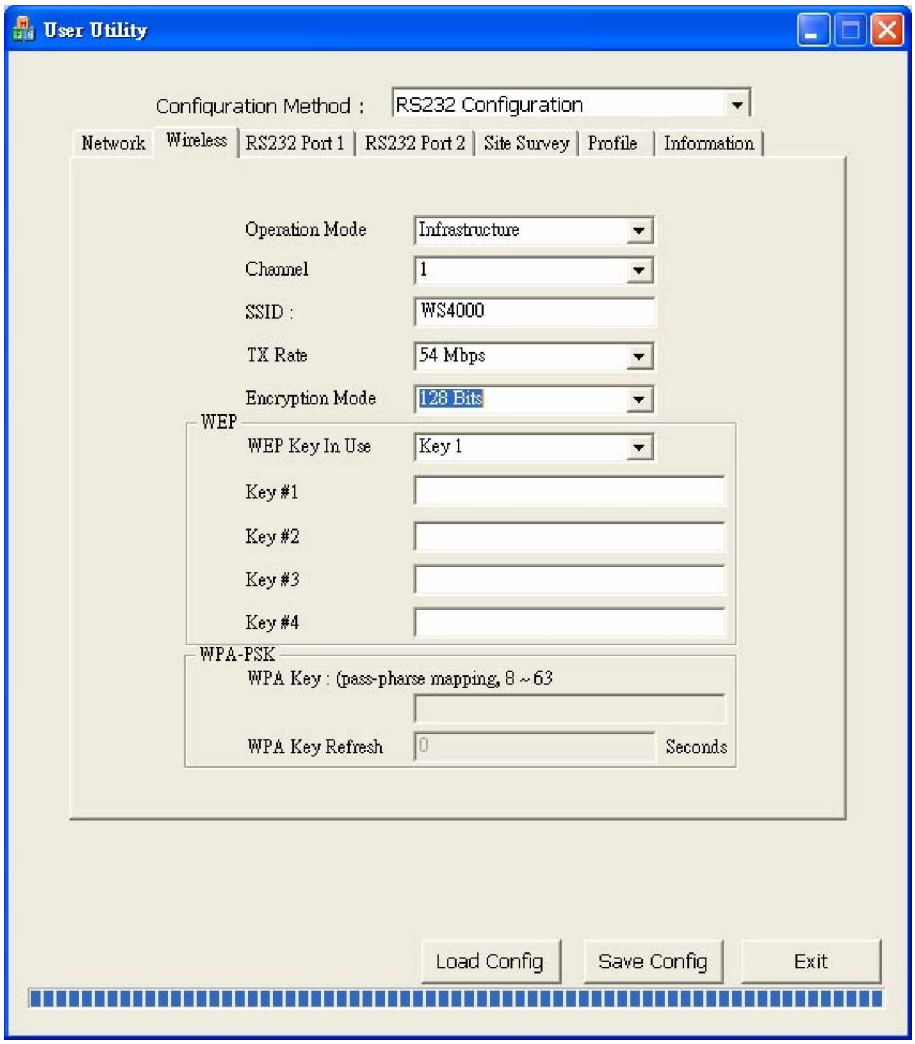

- **Operation** Mode: To select infrastructure or Ad-Hoc mode.
- **Channel**: As in Ad-Hoc mode, user can set the channel to match with another side station.
- **SSID**: User can set the SSID to match with the AP(Infrastructure mode) or station(Ad-Hoc mode).
- **TX Rate**: User can set the TX rate to fit with the operation environment.
- **Encryption** Mode: User can set the encryption mode to set the encryption function.

5. RS232 Port 1 section enables user to set the Baud Rate, Parity, Data Bits, Stop Bits, Flow Control, Local TCP Port, Remote IP, Remote TCP Port, Idle Time, and Port 1 Mode.

Note: For Port 1 being setting as **Client** mode, the program of remote server should be ready for connection (listening at IP listed in “Remote IP” and TCP port listed in “Remote TCP Port”).

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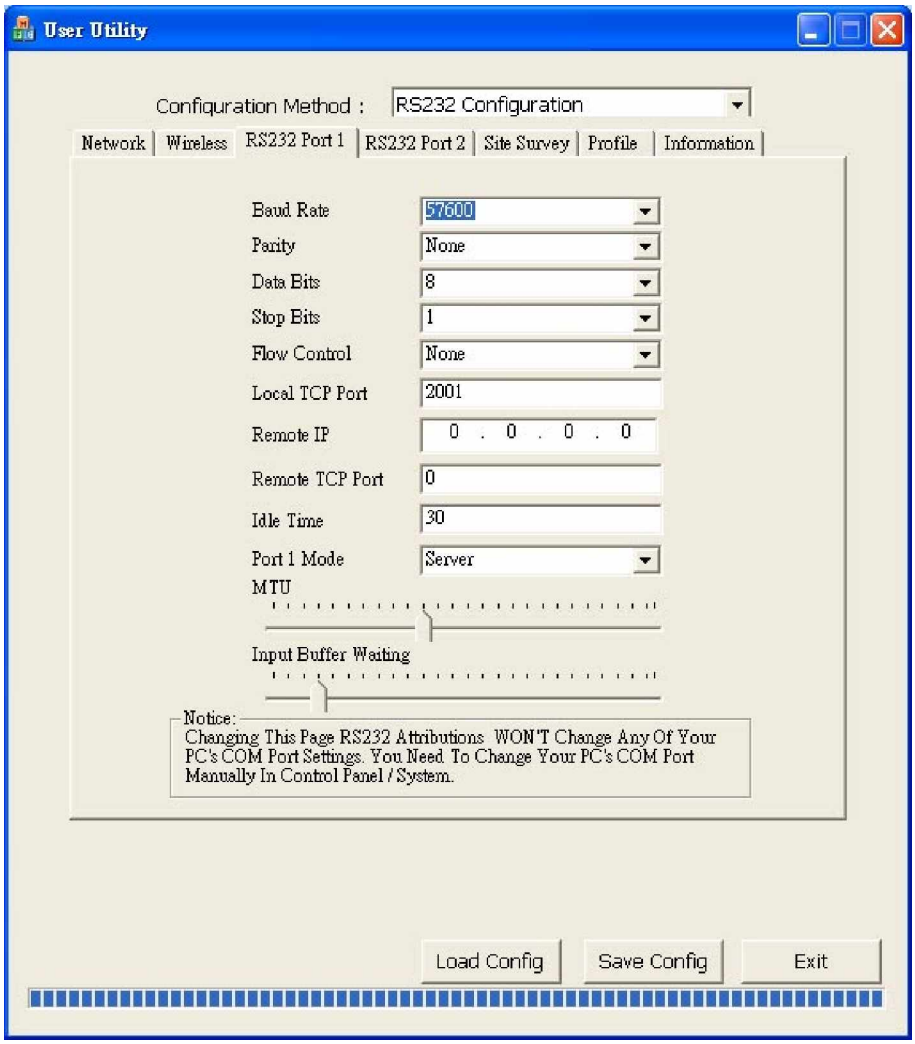

6. RS232 Port 2 section enables user to set the Baud Rate, Parity, Data Bits, Stop Bits, Flow Control, Local TCP Port, Remote IP, Remote TCP Port, Idle Time, and Port 2 Mode.

Note: The Port 2 setting is the same as Port 1.

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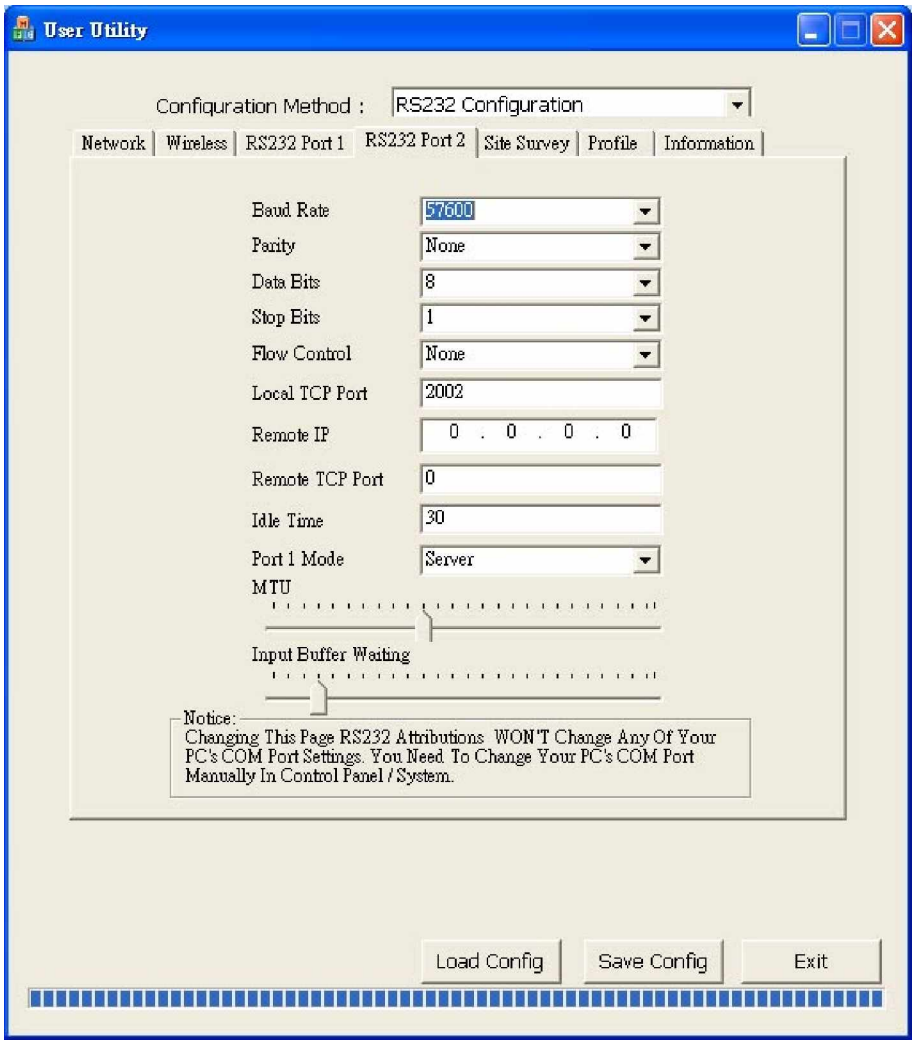

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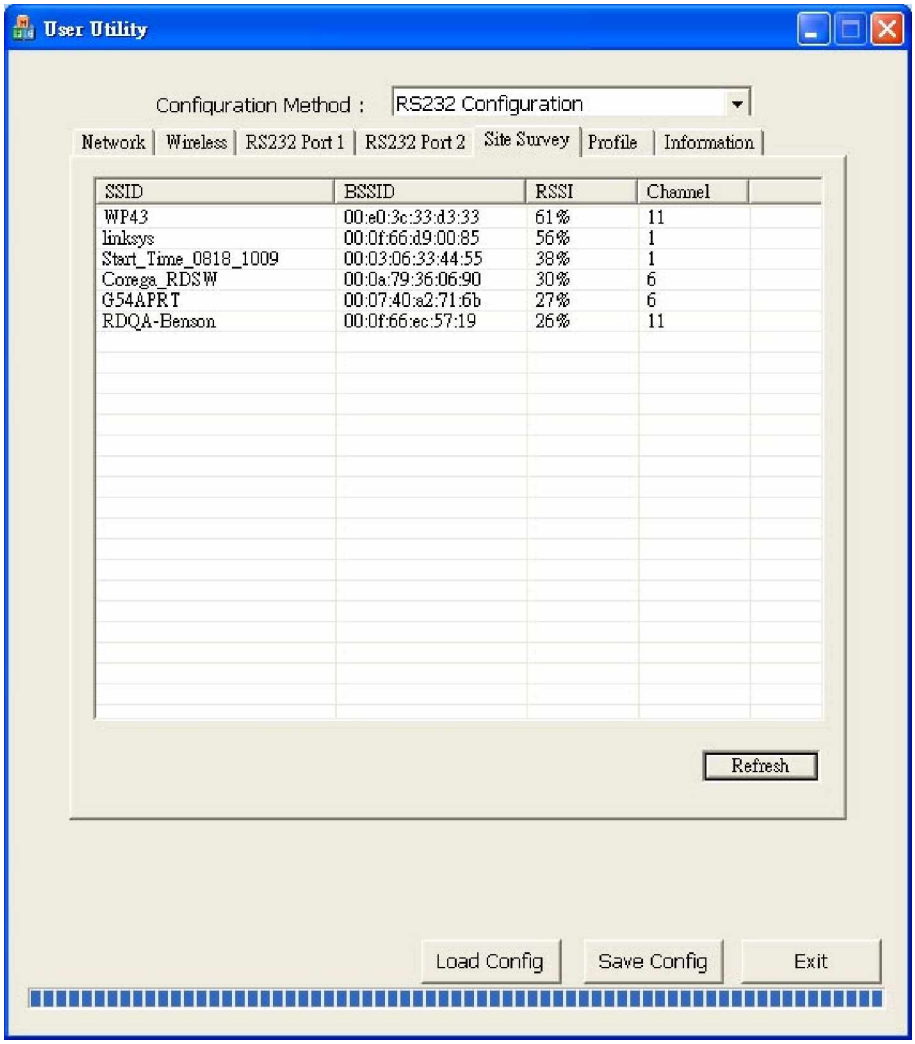
Site Survey section enable user to survey the AP site. Click **Refresh** to survey.



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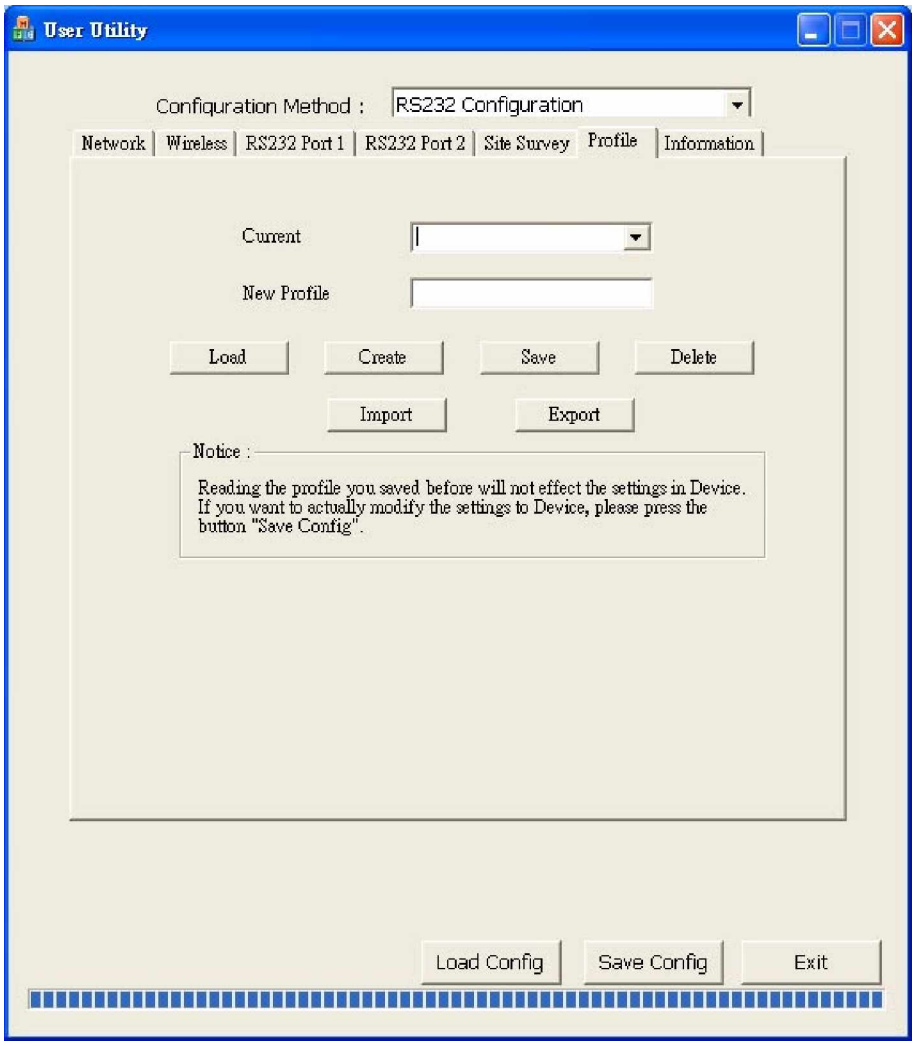
Profile section enables user to set and save the profile for different connection settings. User can import and export the profile to another Server.



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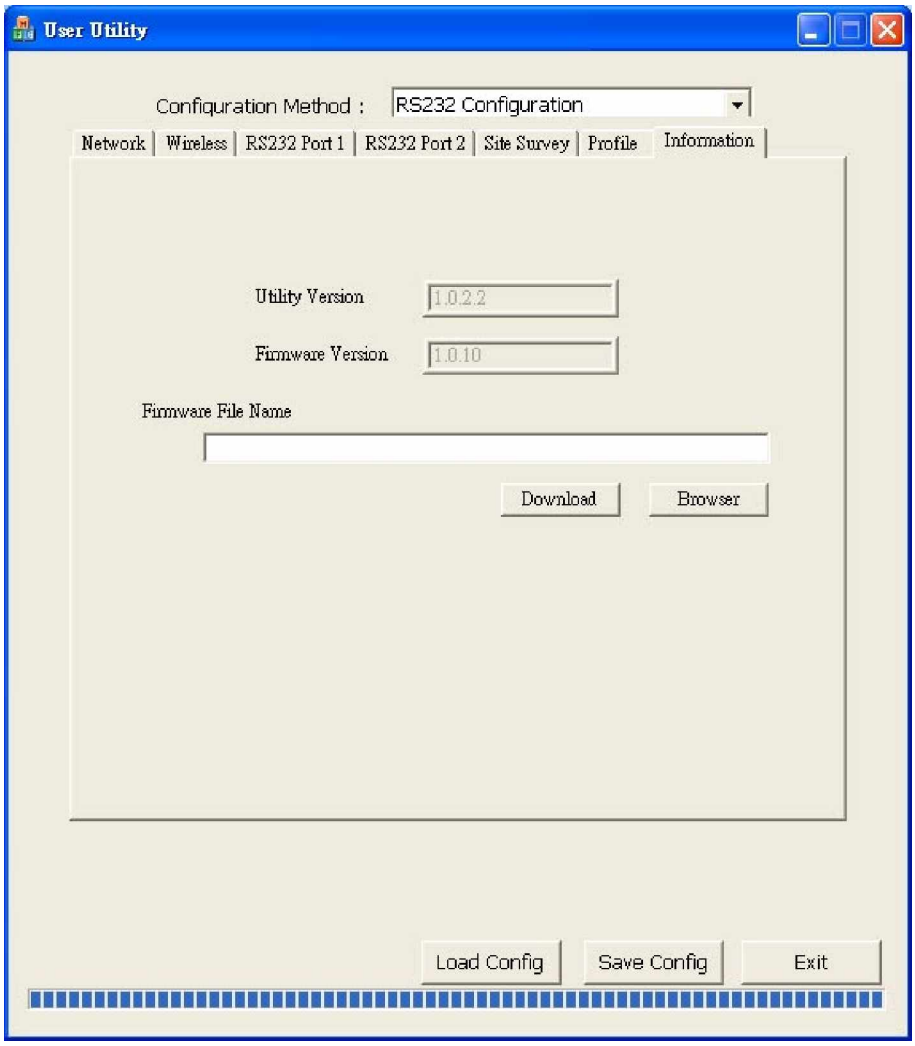
Information section enables user to upgrade the firmware. It is strongly recommended to download the Firmware via the TCP/IP connection for fastest download.



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5. Ad Hoc (Peer-to-Peer) Mode

Linking two Serial Server devices together in a "Cut Cable" type of application.

Two Peer devices may be linked together to form a direct connection without an Access Point between them. This direct one-to-one connection is called **"Ad Hoc" mode (also called "Peer-to-Peer"**). It is also called 'cut cable" since it wirelessly simulates a cabled installation.

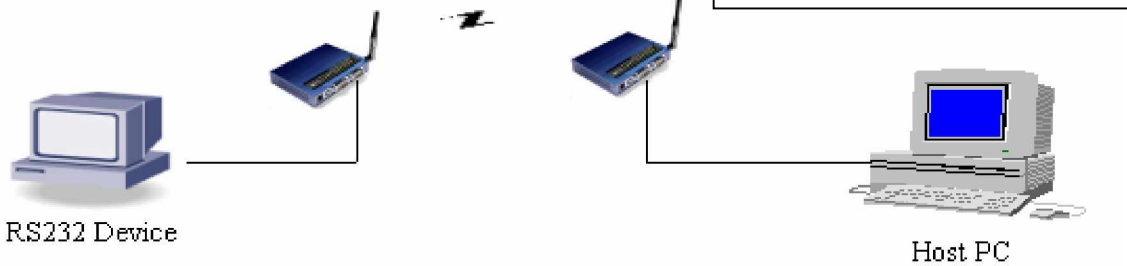
In addition to paired Serial Server links (serial Server–to–Serial Server) the Ad Hoc mode is also used for other peer-to-peer links such as Serial Server-to-Laptop, Serial Server-to-PDA, and Serial Server-to-USB Dongle links, and examples of these connections are shown on subsequent pages.
This Ad Hoc mode example shown below simulates a "cut cable" by wirelessly eliminating a cable with data transferring to/from Serial Server_1 Port 1Male connector and wirelessly linking to Serial Server_2 Port 2 Male connector.

Hint: A key to getting Ad Hoc to work properly is to assign one Peer device set as "Server" and set the other Peer device set as "Client."

Assume that Serial Server_1 is connected to RS232 device via RS232 port 1 and Serial Server_2 is connected to another RS232 device such as a Host PC via RS232 port 2.

For this example Serial Server_1 will be configured as **Server** mode.
When switched to Ad Hoc mode, the Serial Server will send out a beacon with its SSID (network) name.

Serial Server_2 will be configured as **Client** mode.
When switched to Ad Hoc mode, the Serial Server will send out a beacon with its SSID (network) name.
The **Client** device will given the **IP address** of the **Server** Device and thus will "target" the Server device.



Ad Hoc Mode Configuration

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The following procedures can be used to set up the Ad Hoc (Peer-to-Peer) mode for two Serial Server Devices. The examples are real values that will result in a functioning set up. There is space provided for you to enter in your own choice of values in a printout.
The two Serial Server devices Set Up screens are shown side-by-side so the settings relationship of the two devices can be better understood.

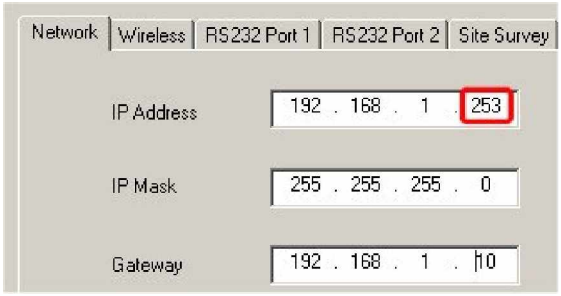
Server Device:

This device will be configured as "Server". The "Server" device will wait to be contacted by a "Server" device that sends out a beacon.

1a) Configure Serial Server_1 "Net" Tab window as follows:

The IP Address of this device is set to 192.168.1.**253** (for example). Make sure no other device uses this IP address. If another device already uses 192.168.1.253, then change to another appropriate IP address.
(Notice the address for Serial Server_1 and Serial Server_2 (in the right hand column) are different.)

"Server" Device "Net" Tab Set Up



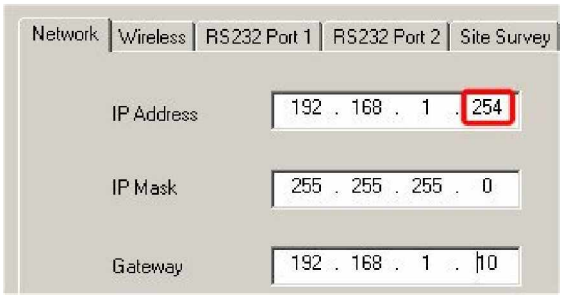
Client Device:

This device will be configured as "Client". The Client device will send out a beacon to try to connect to the "Server" device.

1b) Configure Serial Server_2 "Net" Tab window as follows:

The IP Address of this device is set to 192.168.1.**254** (for example). Make sure no other device uses this IP address. If another device already uses 192.168.1.254, then change to another appropriate IP address.
(Notice the address for Serial Server_1 (in the left hand column) and Serial Server_2 are different.)

"Client" Device "Net" Tab Set Up



With a Subnet Mask of "255.255.255.0", the IP addresses should be the same up to the last decimal (dot). The last value can be any number between 0 and 255 that has not already been allocated.

My "Server" IP address is:
(you can write your "Server" Device IP address here).

_____ . _____ . _____ . _____

My "Client" IP address is:
(you can write your "Client" IP address here).

_____ . _____ . _____ . _____

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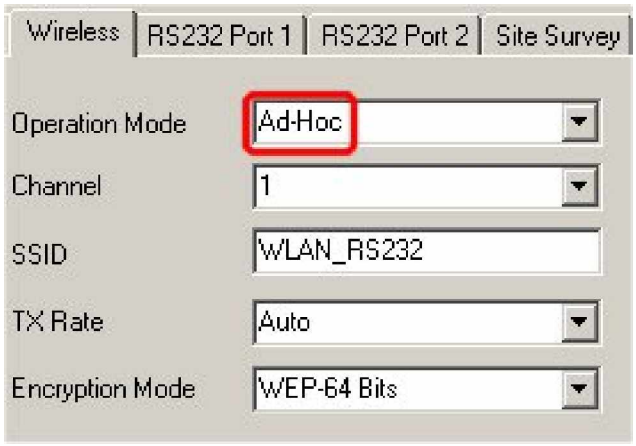
Server Device: Client Device:

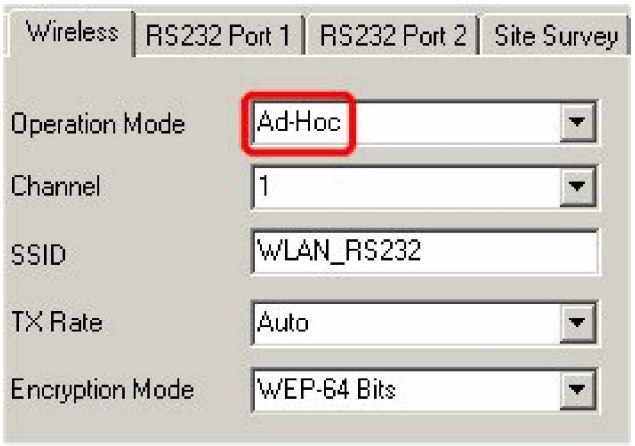
2. Configure **both** Serial Server_1 and Serial Server_2 "Wireless" tab windows as follows:

2a. The **Operation Mode** is set to **Ad hoc** (instead of Infrastructure). **This is a key to Peer-to-Peer operation, in that both Peer devices must be in "Ad Hoc" mode.** This is also true if the second Peer device is not another Serial Server device, but might be a Laptop, PDA, USB Dongle or any other Peer Device.
Note that both devices have the "Wireless" tab settings set exactly the same for both "Server" and "Client" devices.

Serial Server_1 "Wireless" Tab



Serial Server_2 "Wireless" Tab



2b. **Channel:** Select a WLAN Channel that is not locally used by other local devices, e.g. Channel 1 in this example. Hint: **BOTH devices MUST be set exactly to the same channel.** (This is not like Infrastructure mode where the channel selection does not matter because in Infrastructure (Network mode) the Serial Server Device jumps to the channel of the strongest Access Point with the same SSID.) But **in Ad Hoc mode, the two devices are being paired and locked together including exactly matching the channel settings.**
You can check for channel usage in your location by using the "Site Survey" tab.
My Channel setting is channel _____ (Hint: channels 1, 6, 11 are non-overlapping).

2c. **SSID:** Assign the same SSID (Network Name) to each device, for example "WLAN_RS232".
You can use another channel or SSID name as you like, but both Serial Server_1 and Serial Server_2 must have the same exact SSID as well as the same channel.
My SSID (network name) is _____

2d. **Encryption:** If Encryption is set to "Disable", then WLAN WEP/WPA encryption function is not activated. But if Encryption is activated by setting to WEP or WPA, then both Serial Server "Server" and Serial Server "Client" must be set to the exact same values for Encryption, WEP Key Use, and Key values. (Note that it is easier to get the devices working together WITHOUT any encryption enabled, because it is a significant item that can be easily miss-set. You can always enable WEP or WPA security after the Peer-to-Peer is set up and is operating correctly.) WEP and WPA key values are "hexadecimal" which is 0-9 and A, B, C, D, E, F.
My Encryption Key is:
( ) WEP-64 __ __ __ __ __ __ __ __ __ __ (10 characters)
( ) WEP-128 __ (23 characters)
( ) WPA – TKIP _____
( ) WPA – AES _____

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3) Setting RS232 Serial Port settings for Ad Hoc

Remember that in this example we are eliminating a cable assembly with data transferring to/from Serial Server_1 Port 1Male connector and wirelessly linking to Serial Server_2 Port 1 Male connector. The key to Ad Hoc is have one Peer device set as "Server" and the other Peer device set as "Client." **Thus the "Client" device points-to (targets) the "Server" device.** The same configuration philosophy of settings for this Port1 also applies to the second Port2.

Serial Server "Server" RS232 Port1

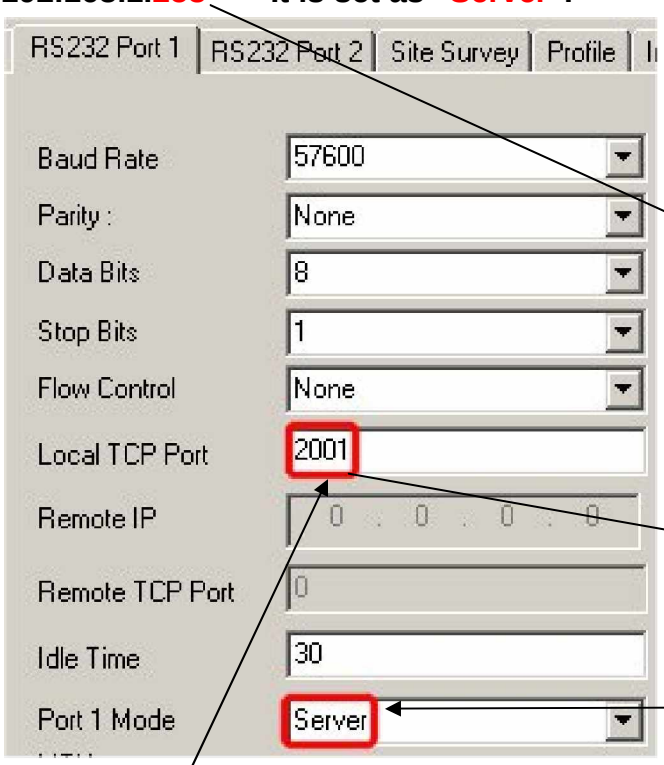
3a) Configure Serial Server_1 RS232 Port 1 (Male connector) with mode set to "**Server**" (Serial Server_2 RS232 port 1 will be set as "**Client**" in the right hand column).
The "grayed-out" Remote IP and Remote Port are not used when the device is set as "Server." (Remember that the IP address set for this device was "192.168.1.253" which will be entered into Serial Server_2 "Remote IP" (as shown in the right hand column.)

See settings below, how a "Client" device "Targets" the "Server" device.

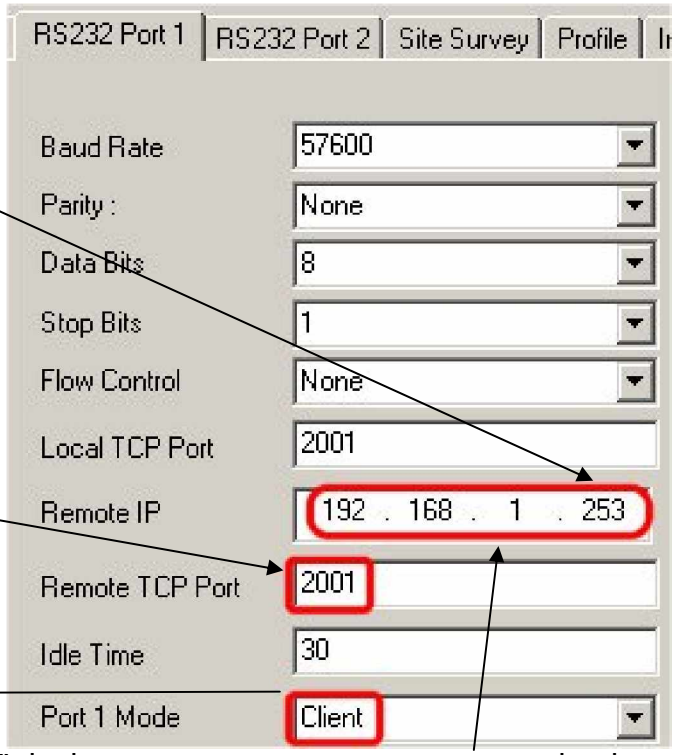
Serial Server "Client" RS232 Port1

3b) Configure Serial Server_2 RS232 Port 1 (Male connector) with the Mode set to "**Client**" (see red circled near bottom of the window) (Serial Server_1 RS232 Port 1 was set as "**Server**"). Note that when you set this device to "Client" the grayed-out Remote Port and Remote IP became active. Set the Remote Port of Serial Server_2 to match the "Local Port" setting for the target TCP port on Serial Server_1 (2001) as seen on the left column. Remember that the IP address assigned to Serial Server_1 was 192.168.1.253, so enter that address into the Remote IP field of Serial Server_2.

Remember this device IP Address is 192.168.1.253 It is set as "Server".



Remember this device IP Address is 192.168.1.254 It is set as "Client".



The **IP network address** I chose for the "**Server**" device was ___ . ___ . ___ . ___ , so that is the IP address that needs to be loaded into the "Remote IP" field of the "**Client**" device.
There are 2 ports on the Serial Server, and you need to tell this **Client** device to which port on the "Server" to point. The TCP port of the Server device I want the Client device to point to is _____ (hint: use 4 or 5 digit number (greater than 2000).

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The Client device has now been configured to point to the Server device.
The fastest linkage will be if the Server device is already powered up when the Client device is power up, but linkage will occur in any event.

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6. Ad Hoc connection: Laptop to Serial Server Device

This application note is specifically created for Dell Laptop computers but it is similar to all Laptop devices running XP with SP2.

Setting up a Serial Server device for Ad Hoc (Peer-to-Peer) to a Wireless Laptop/Notebook PC.

1. In the **Set Up Utility** of the Serial Server device, select the **Wireless** tab.
2. Select **Ad Hoc** as the **Operation Mode**. (Ad Hoc is for Peer-to-Peer mode.)

Note: this will cause the Serial Server to send out beacons to broadcast the SSID network name you chose. Any laptop that does a survey of available wireless networks to link to should be able to read this beacon and display the Network Name in order for you to link to it.

3. Enter the **SSID** network name you chose to be broadcast. For this illustration, the name WLAN_RS232_AdHoc is entered.
4. **Encryption Mode:** If you have **XP OS with SP2** installed on your laptop, you will need to enable a security encryption mode and enter a key value. The simplest is to use the WEP-64 key. XP-SP2 will force you to use a security encryption key. If you have XP-SP2 you do not have a choice, you must enter an encryption key.

NOTE: The WEP network key must be either **exactly 10 characters long (WEP-64)** or exactly 26 characters long (WEP-128) **using the hexadecimal numbers 0-9 and the letters a-f (A-F) (letters can be uppercase or lowercase)**.

5. Save your settings with the **Save** button on the Utility.

My IP address is:
(Located on "Network" tab.)
(You can write your Device IP address here).

_____ . _____ . _____ . _____

My Channel setting is channel _____
(Hint: channels 1, 6, 11 are non-overlapping).

My SSID (network name) is:

_____

My Encryption Key is:

( ) WEP-64 (10 characters)

__ __ __ __ __ __ __ __ __ __

( ) WEP-128 (23 characters)

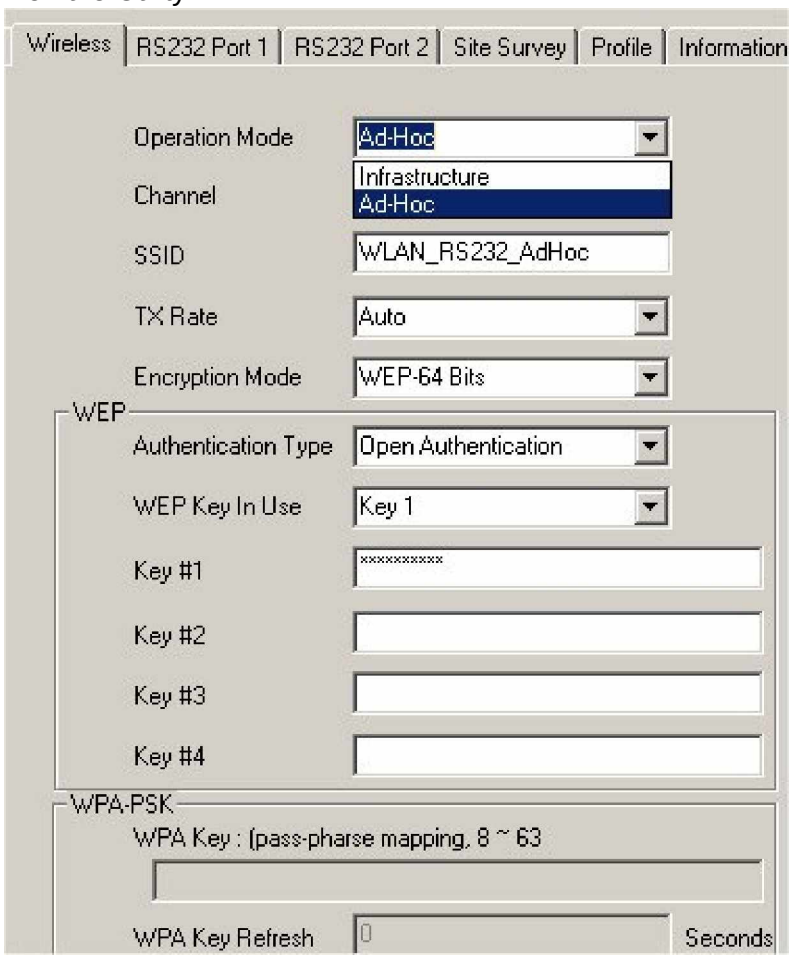
__ __ __ __ __ __ __ __ __ __ __ __ __
__ __ __ __ __ __ __ __ __ __ __

( ) WPA – TKIP

_____

( ) WPA – AES

_____



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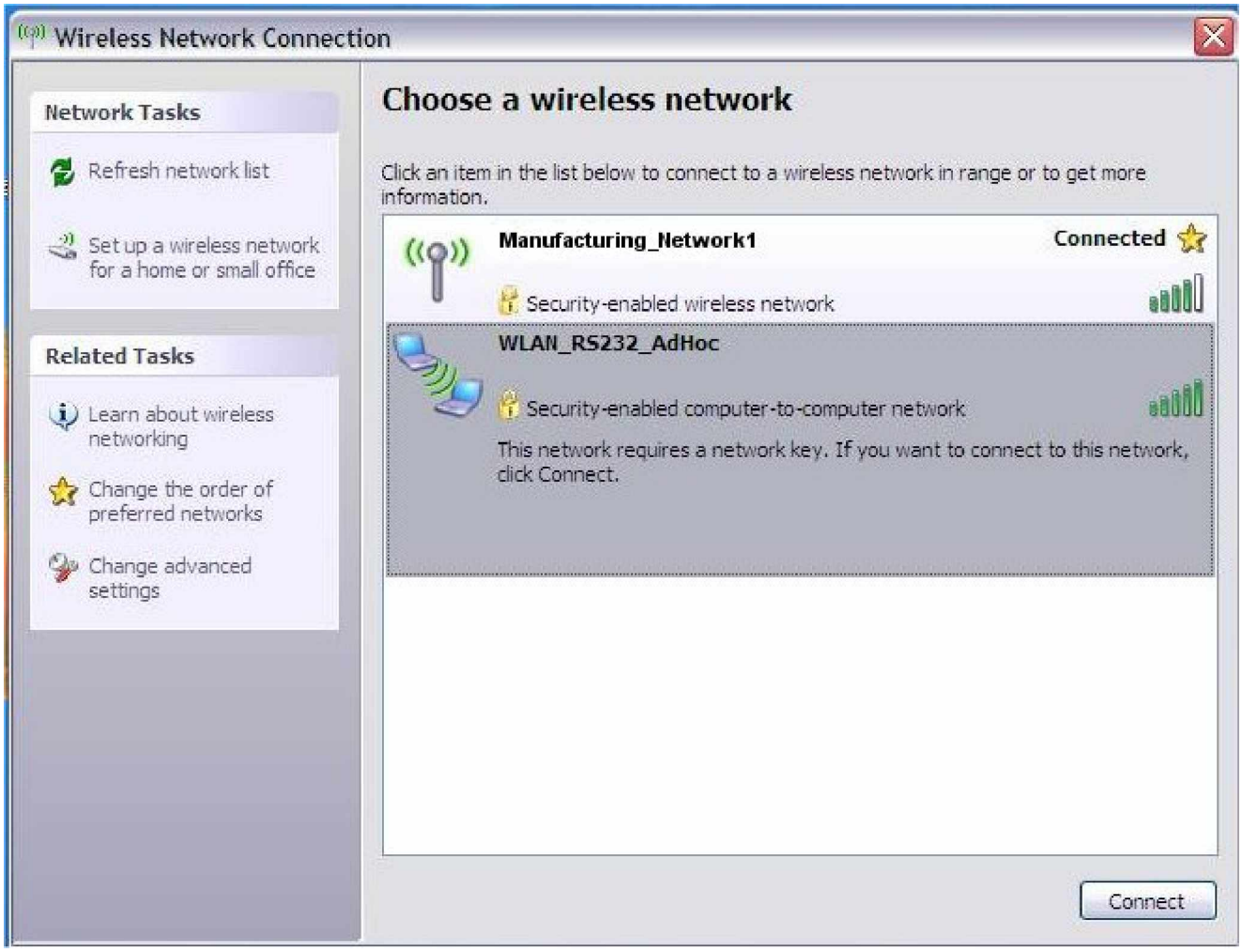
Setting up a Laptop/Notebook PC for Ad Hoc (Peer-to-Peer) to a Wireless Serial Server device.

1 On your Laptop or Notebook computer, click on the **Wireless Networks** icon in the system tray in the lower right of the XP laptop screen.
2 Click on **View Available Networks**.
3. Find the Serial Server network name you created during set up of the Serial Device. Notice that since the Serial Server was set to **Ad Hoc mode**, it sends out a beacon with its network name (in this case "WLAN_RS232_AdHoc") the network name will appear in a list of available wireless networks when you "Refresh network list".
4 Tap the **Connect** button at the lower right to link the laptop to the selected Serial Server network. Follow the prompts to complete Ad Hoc connection to the Serial Server.
5 If you do not see the Serial Server network name you assigned to the Serial Server, you may need to proceed on to the section immediately following this entitled **Creating an Ad Hoc Network from a Laptop/Notebook PC to another Peer Device**. Then return to this section to complete connection to the Serial Server device Ad Hoc network.


Wireless Network Connection
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Choose a wireless network
Click an item in the list below to connect to a wireless network in range or to get more information.
Manufacturing_Network1
Connected
Security-enabled wireless network
WLAN_RS232_AdHoc
Security-enabled computer-to-computer network
This network requires a network key. If you want to connect to this network, click Connect.
Connect

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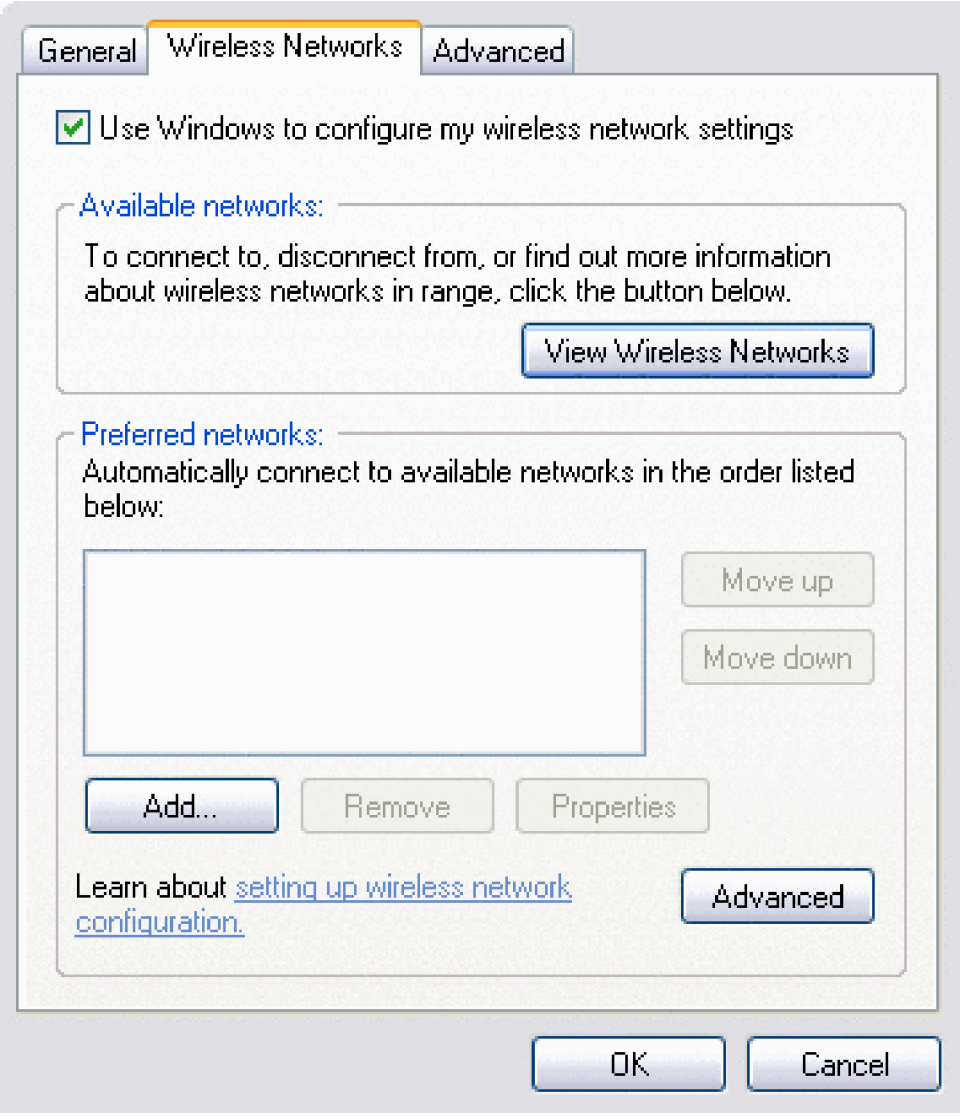
Creating an Ad Hoc Network from a Laptop/Notebook PC to another Peer Device.

If you can not simply link to the Ad Hoc network name when searching for available wireless networks, it may be because your laptop is not set up to allow connection to Ad Hoc networks.
So proceed as follows.
On the Laptop/Notebook PC
1 Open **Network Connections** in Control Panel.
2. Right-click **Wireless Network Connection**, and then click **Properties**.
3 On the **Wireless Networks** tab, verify that the **Use Windows to configure my wireless network settings** check box is selected. If it is not, click to select the check box.
4 Click **Add**.



5 Type the network name in the **Network name (SSID)** box.
6 Select the **This is a computer-to-computer (ad hoc) network; wireless access points are not used** check box.
7 Click **Open** in the **Network Authentication** list.
8 To create an ad hoc network with no security settings, click **Disabled** in the **Data encryption** list.

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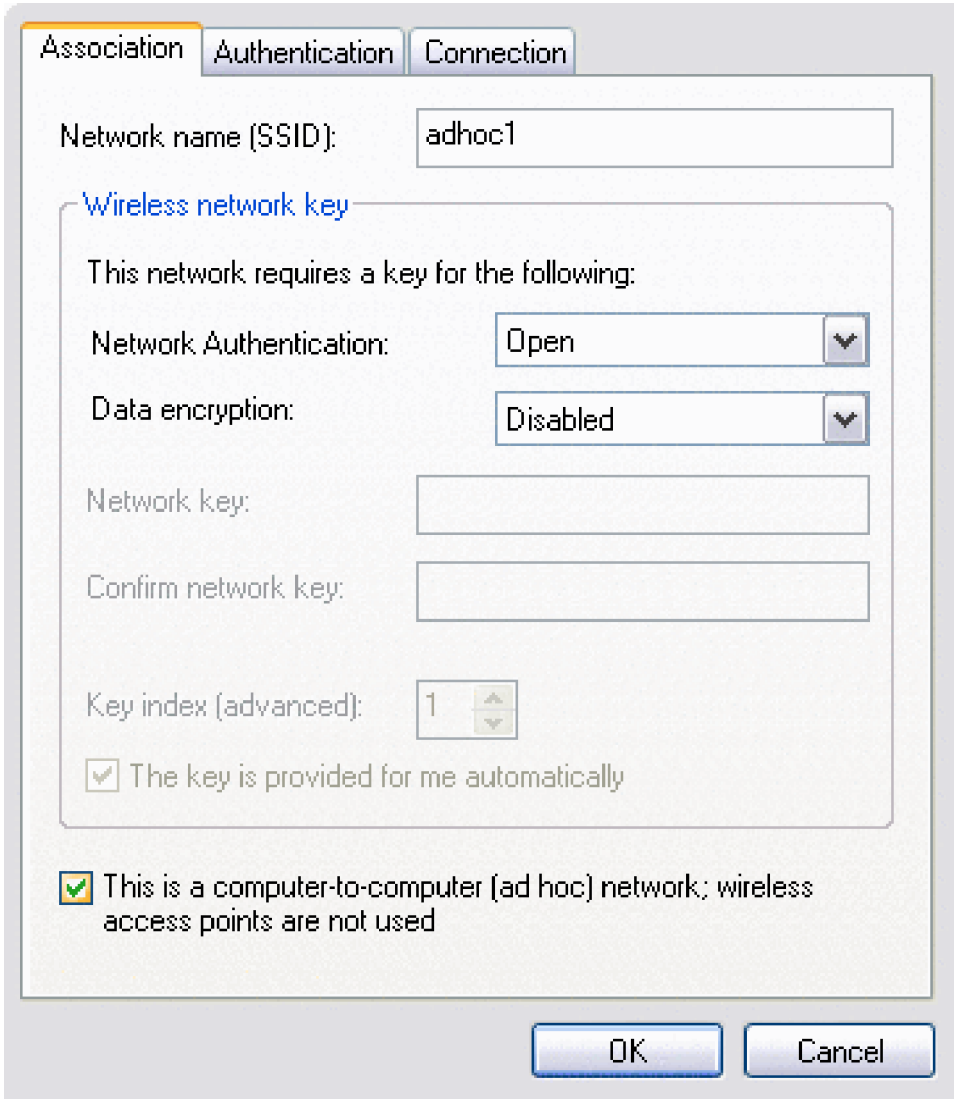
–or–

To create an ad hoc network that has WEP encryption, clear the **The key is provided for me automatically** check box, click WEP in the Data encryption list, and then type the network key in the Network key box and again in the Confirm network key box.

NOTE: The network key must be either **exactly 10 characters long (WEP-64)** or exactly 26 characters long (WEP-128) **using the hexadecimal numbers 0-9 and the letters a-f (A-F) (letters can be uppercase or lowercase)**.

9 Click OK.



10 On the **Wireless Networks** tab, click **OK**.

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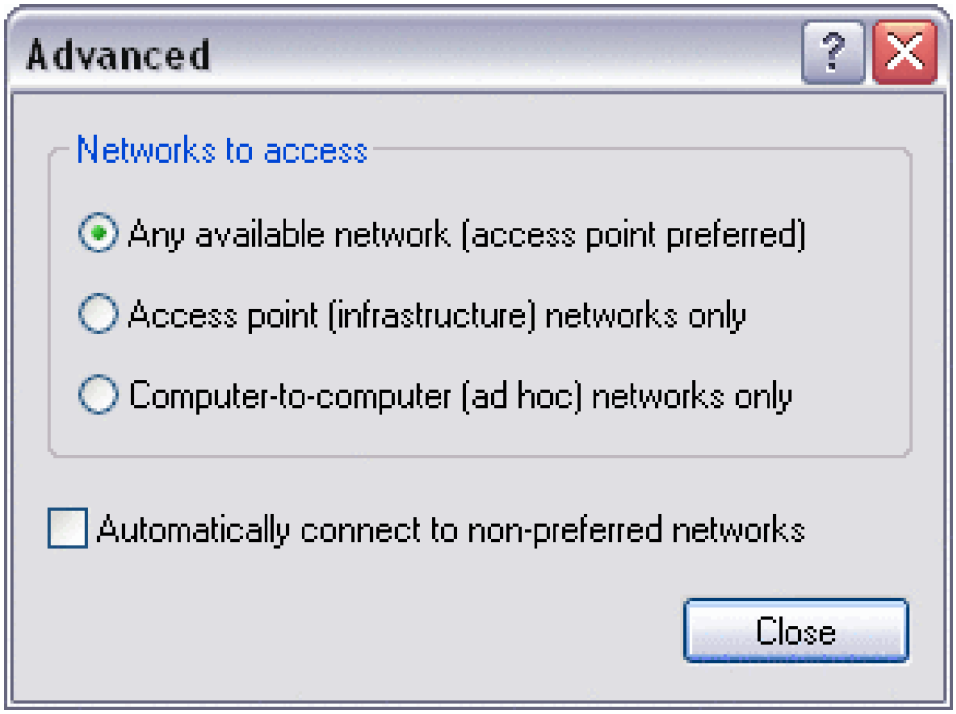
Choosing Which Types of Networks to Access

1. Open **Network Connections** in Control Panel.
2. Right-click **Wireless Network Connection**, and then click **Properties**.
3. On the **Wireless Networks** tab, click **Advanced**.
4. Under **Networks to access**, click the option you prefer. For Ad Hoc network you must either choose either:
Any available network (access point preferred) or
Computer-to-computer (ad hoc) network only.

and then click **Close**.



5 On the Wireless Networks tab, click OK.

References:
http://support.dell.com/support/edocs/network/p70008/EN/xpbasic.htm#toc_15

End of section.

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7. Upgrading Firmware

7.0 Are you Registered to receive emailed Notification of Updates? As a purchaser of the Server device, you are entitled to receive email notice of any upgrades and enhancements. If you have not registered onto the Product Registration List to be automatically notified of Firmware upgrades and feature enhancements, you may register at the factory web site listed on the **Contacts** page of this user manual.

7.1 Setting up to Upgrade Firmware

7.1.1 Plug in Power Supply to Power Jack

It is especially important that the Server receive adequate power during this sensitive Firmware Upgrade Procedure. A laptop PC in particular may be especially frugal in restricting the amount of power that can be extracted from the USB port, and the Server may be power-starved. So always use a power supply when upgrading firmware.

7.1.2 Set the "Config./Communications switch **UP** to the Configuration Mode.

7.13 Firmware can be upgraded using over-the-air TCP/IP (the fastest method) or either RS232 port (slower) as described in the following sections (upgrade via USB port is forbidden since it is so slow)**. But please read important Sections 4.2 and 4.3 first.**

For over-the-air TCP/IP Firmware upgrade – see Section 4.4

For RS232 Firmware upgrade – see Section 4.5

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7.2 How to Read the Current Firmware and Set Up Utility Software Versions

From the Information Tab:

Read the current **Set Up Utility** program version in the “Utility Version” box.

Read the current **Firmware revision level** of the Server in “Firmware Version” box. Firmware is the software that drives the Server and determines the operating characteristics of the Server.

If newer Firmware Version is available, the Firmware can be loaded into the Server from this **Information** tab section of the Set Up Utility.

7.3 Loading New Firmware

Cautionary Note: The Firmware files are VERY LARGE FILES, and if the method you select of transferring the data into the Server is slow then it can take a long time to load and store the file into Flash Memory.

The Preferred Method of Loading Firmware: If your installation is able to load the new Firmware using the fastest method available (“over-the-air TCP/IP”) it will take considerably less time than using a serial port or the USB port. If it is necessary to use a Serial Port or USB port it can take 10 minutes or so to load the firmware by these slower methods.

Since the over-the-air TCP/IP method of firmware upgrade is the fastest and preferred method, it is illustrated first.

7.4 Fastest Method: Loading New Firmware using TCP/IP “over-the-air”

For this procedure of loading Firmware over-the-air, **you *must* be able to connect over-the-air with the Server**. Thus all of the normal wireless network connection process must be functioning, including that the PC you are running the Set Up Utility must have a connection to the wireless network and the settings for the RS232 Serial Server must match the network settings.

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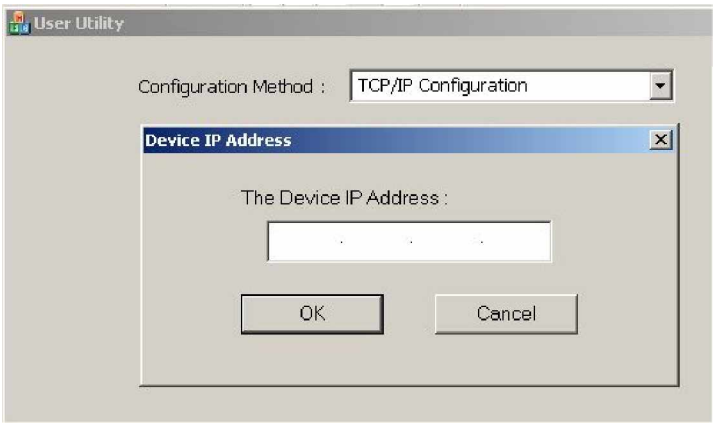
A quick Ping test: Can the Server device “Ping” from the PC that is running the Set Up Utility? If the Server can not be pinged then certainly there is not a connection made to upload new firmware to the Server via over-the-air TCP/IP. (See Section XX.X “How to Ping Test”.)

Presuming that there is a successful wireless network connection between the PC running the Set Up Utility and the Server device to receive the Firmware upgrade, continue by reading the Server settings wirelessly using the over-the-air TCP/IP method.
From the **Configuration Method** options select the method **TCP/IP Configuration**.

Enter the IP Address you have assigned to the Server.



In this example, the Factory Default IP address is shown.

Tap the “OK” button to accept the IP settings and allow the Set UP Utility to attempt to connect with the Server.

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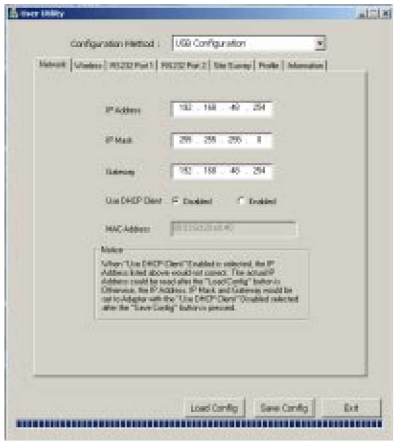


Result 1: Wireless Connection Successful

If the wireless link connection is successful, then the Utility will open with the display of the Network settings read from the Server.

Jump down "**Loading Firmware into the Server"**

Result 2: Wireless Connection NOT Successful

If the wireless link connection is NOT successful, then the Utility will display the error message that it can't connect to the Server.

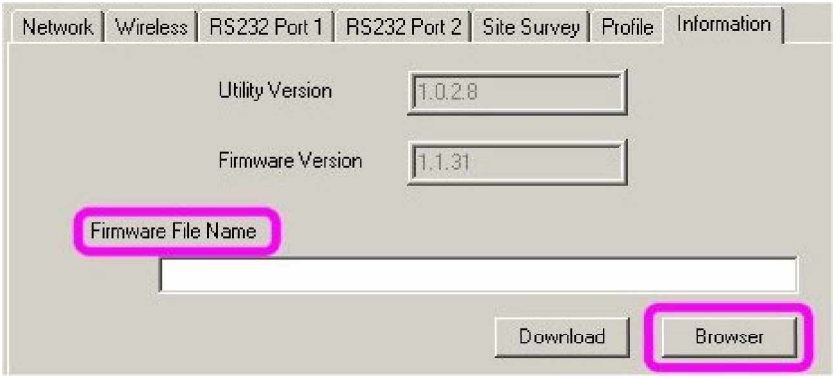
Please refer to the Section XX **Trouble Shooting: Problems with making a wireless connection to the Server.** If the wireless connection to the Server still cannot be made, consideration should be given to loading the new Firmware via the slower RS232 or slower USB interface by using the instructions in the following sections:

Loading New Firmware using Either RS232 Port on the Server

Presuming there is now a confirmed wireless network connection between the PC running the Set Up Utility and the Server device, continue by now loading the new Firmware.

Loading Firmware into the Server

Use the Browser button to locate the Firmware file where it has been stored on the PC. The file will typically have a name similar to "**run.bix.fw**".



Once the Firmware has been located and applied into the Browser bar, the Firmware download can be started by tapping the **Download** button.

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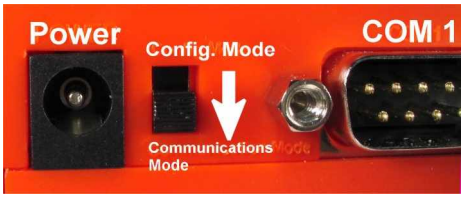
WARNING! Once the download activity has been started, do not disrupt download activity for any reason.

Download using over-the-air TCPIP make take 1 to 2 minutes as the Progress bar indicates the Firmware download progresses.

When the Firmware download is completed, the **Firmware Transmission Done** message will display.

This should complete the Firmware upgrade. At this time the Configuration Switch on the rear of the Server can be switched down to the Run position to resume operation as a Serial Server Device.



Press the “Reset” button for 5 seconds!

After uploading new Firmware in the Serial Server the Reset button on the Front MUST pressed for 5 seconds for the new firmware to take effect. **This is VERY IMPORTANT. Do not ignore this step.**

The Serial Server will revert to Factory Default Settings, so the fields must be entered again for such things as IP Address, SSID, Security Key and so on.

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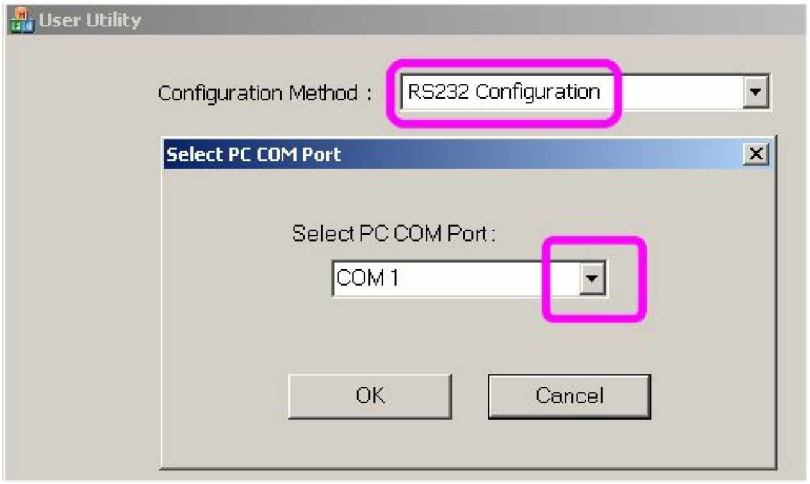
7.5 Loading New Firmware using Either RS232 Port on the Server

For this procedure of loading Firmware via either RS232 Port **you must connect an RS232 cable from a PC that has the Set Up Utility loaded and connect to either DE9 port (a.k.a. DB9) on the Server**.

Either Server RS232 port can be used. However there are differences.
If Server COM Port 2 (DE9-Female) is selected for loading Firmware then a common D9Male-to-D9Female "straight cable" can be used (straight means pin 2 goes to pin 2, pin 3 goes to pin 3, etc.).

If Server COM Port 1 (DE9-Male) is selected for loading Firmware then a NULL Cross cable must be used: D9Female-to-D9Female Null Cross cable (Null cross means pins 2 and 3 cross (pin 2 goes to pin 3, pin 3 goes to pin 2), pins 4 & 6 cross, pins 7 & 8 cross, pin 5 goes to pin 5 (Ground)).

From the **Configuration Method** options select the method **RS232 Configuration**.



The available PC COM ports will be displayed by tapping the Drop Down arrow from the "Select PC COM Port:" field. Note that this is the **PC** COM Port number and this PC COM Port number has nothing to do with the Server COM port number (1 or 2) chosen for the Server connection.

Tap the "**OK**" button to accept the PC COM Port settings and allow the Set UP Utility to attempt to connect with the Server.
Ordinarily the LEDs on the front of the Server change visibly toggling Red/Green as Data is transferred to/from the Server and the PC to read the settings.

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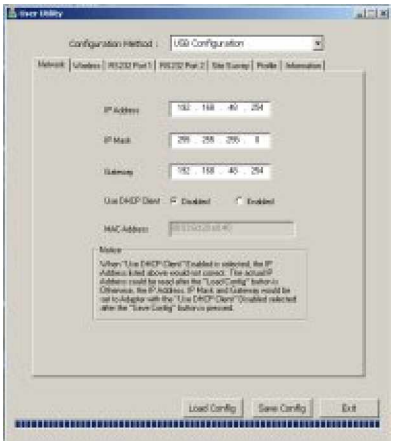


Result 1: RS232 Connection Successful

If the RS232 connection is successful, then the Utility will open with the display of the Network settings read from the Server.

Jump the Section below entitled "**Loading Firmware into the Server"**

Result 2: RS232 Connection NOT Successful

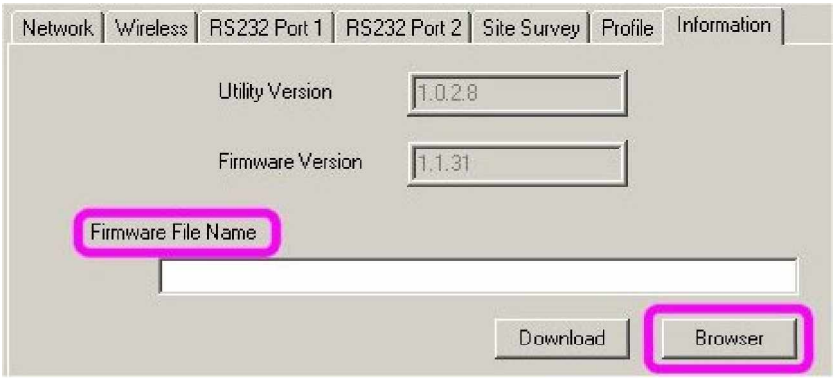
If the RS232 link connection is NOT successful, then the Utility will display the error message that it can't connect to the Server.

WlanSerialSetup
Timeout Occurs. Please Check The Cable(USB Or RS232), The Wireless Connection Or The Switch Button's State.
OK

Please refer to the section XX **Trouble Shooting: Problems with making an RS232 connection to the Server.** If the RS232 connection still cannot be made, consideration should be given to loading the new Firmware via the slower USB interface or by the faster wireless over-the-air TCP/IP method.

Loading Firmware into the Server

Use the Browser button to **locate the Firmware file** where it has been stored on the PC. The file will typically have a name similar to "**run.bix.fw**".



Once the Firmware has been located and applied into the Browser bar, the Firmware download can be started by tapping the **Download** button.

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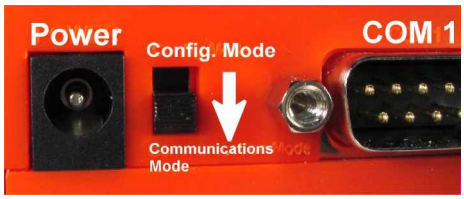
WARNING! Once the download activity has been started, do not disrupt download activity for any reason.

Download using may take 10 or more minutes as the Progress bar indicates the Firmware download progresses.

When the Firmware download is completed, the **Firmware Transmission Done** message will display.

This should complete the Firmware upgrade. At this time the Configuration Switch on the rear of the Server can be switched down to the Run position to resume operation as a Serial Server Device.



Press the “Reset” button for 5 seconds!

After uploading new Firmware in the Serial Server the Reset button on the Front MUST pressed for 5 seconds for the new firmware to take effect. **This is VERY IMPORTANT. Do not ignore this step.**
The Serial Server will revert to Factory Default Settings, so the fields must be entered again for such things as IP Address, SSID, Security Key and so on.

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8. “Ping” Serial Server Over-the-Air from DOS

This section will use an example to show you how to check the TCP/IP connection of Serial Server, AP and Host PC.

Steps:

1) First follow the steps in Section 3.1 to configure Serial Server. As shown in Figure 8, the PC connected with Serial Server is called as RS232 PC.

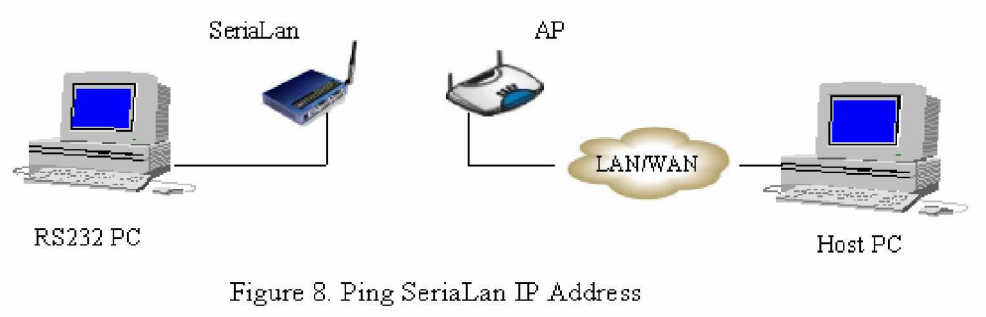
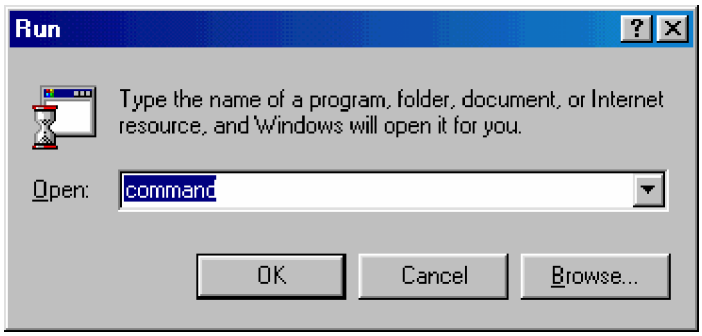


Figure 8. Ping SeriaLan IP Address

2) From the Host PC, go to “**Start/Run**” and type “**command**” at the Run prompt for Window 98, and for Windows2000/XP simply type **"cmd"** at the Run prompt.



3) At the DOS prompt, type (for example) “**ping 192.168.1.243**” where the “192.168.1.243” is the IP address of the particular Serial Server. Press the **Enter** key to begin pinging. Or using the previous example values, type “192.168.48.48”.

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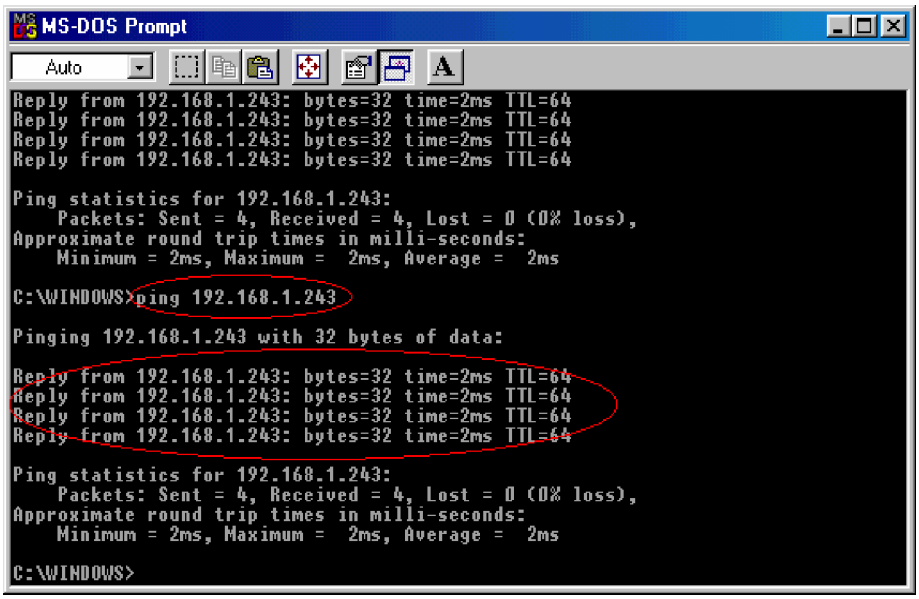
MS-DOS Prompt
Auto
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Ping statistics for 192.168.1.243:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 2ms, Average = 2ms
C:\WINDOWS>ping 192.168.1.243
Pinging 192.168.1.243 with 32 bytes of data:
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Reply from 192.168.1.243: bytes=32 time=2ms TTL=64
Ping statistics for 192.168.1.243:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 2ms, Average = 2ms
C:\WINDOWS>

If DOS responds with the message "**Reply from 192.168.1.243: …**" as shown above, this means the Host PC is connected to Serial Server over-the-air via the AP successfully. If DOS responds the message "**Request time out**", then it means that the Host PC is not connected with Serial Server via Wireless LAN.

4) To check the link quality for a prolonged test, at the DOS prompt, type (for example) "ping 192.168.1.243 **–t**" where the "192.168.1.243" is the IP address of the particular Serial Server, and the "**–t**" causes the program to ping endlessly until halted. Press the **Enter** key to begin pinging.

- Press the **Ctrl-Break** keys to review current ping statistics, without disrupting the ping tests.
- Press the **Break** key to temporary **halt** the ping. And then press Enter to resume the ping.
- Press **Ctrl-C to end** the ping activity and get a final ping statistic report.

5) If Host PC cannot connect with Serial Server via Wireless LAN, some steps can be used to solve the problem:

a) Follow the steps in Section XX to make sure all settings are correct.

b) Use site survey tool, described in Section XX, to check the radio signal.
If it cannot find the available AP, then you need to relocate Serial Server (or the AP).

c) Make sure Host PC, AP and Serial Server are on the same IP subnet.

d) If there are multiple Serial Servers, then make sure each Serial Server has a

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different IP address and different MAC address.

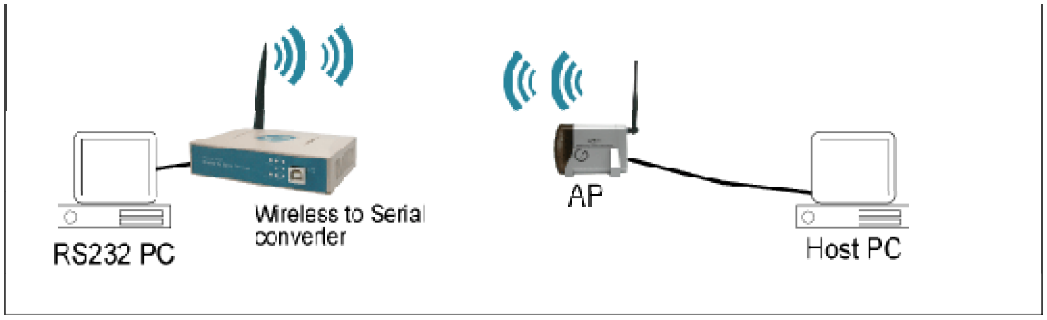
e) If an Internet Gateway has been used, then ping the Gateway IP address to make sure the Host PC is connected to the LAN correctly.

6) The Serial Device itself can be pinged but it can't ping other devices (including another Serial Servers). In the Ad Hoc mode (for more detail, refer to Section XX), when both sides all use Serial Server, then being unable to ping is normal.

9 Simple Demo via HyperTerminal

To establish a simple demo system via HyperTerminal, please follow the direction.

1. Open the HyperTerminal window at the **Host PC**. Go to
   Start à ***Programs*** à ***Accessories*** à ***Communications*** à ***HyperTerminal*** à ***HyperTerm***



2. Select TCP/IP protocol to connect to the converter and specify the converter IP address and TCP port number the same as the local TCP PC. If the converter uses RS232 port 1 (port 2) to connect with RS232 PC, then TCP port number shall be that for RS232 port 1 (port 2).(Assume that the RS232 port 1 (port 2) is set to server mode.)

3. Open another HyperTerminal window at the RS232 PC. The RS232 parameters settings should be same as the values of RS232 port settings in converter.

4. The RF WLAN link should now be active. Enter any character from RS232 (or Host) PC. The Host (or RS232) PC HyperTerminal will show the character that you just enter. Or you can transfer any data or file from either PC using **Kermit protocol**, and then the other side will receive the data by using **Kermit protocol** as well.

5. If it is unable to use HyperTerminal for testing, some steps can be used to solve the

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problem:

- Ÿ At WLAN tap window, the SSID field is allowed to enter any character, including space character. If one converter has space character after SSID name then two converters will have different SSID.
- Ÿ Disconnect HyperTerminal at both sides before make any upgrade on the converter settings.
- Ÿ Disconnect HyperTerminal at both sides before make any change on the HyperTerminal settings.
- Ÿ Make sure the WLAN does connect to each other on both side. Use “ping” command to converter. For example, the IP “192.168.1.254” is default IP of the converter, “ping 192.168.1.254” to testify the connection. If user can ping the IP address, the wireless connection is OK.

Note: During configuration, please close other HyperTerminal program. Any HyperTerminal might occupy the application of the COM port.

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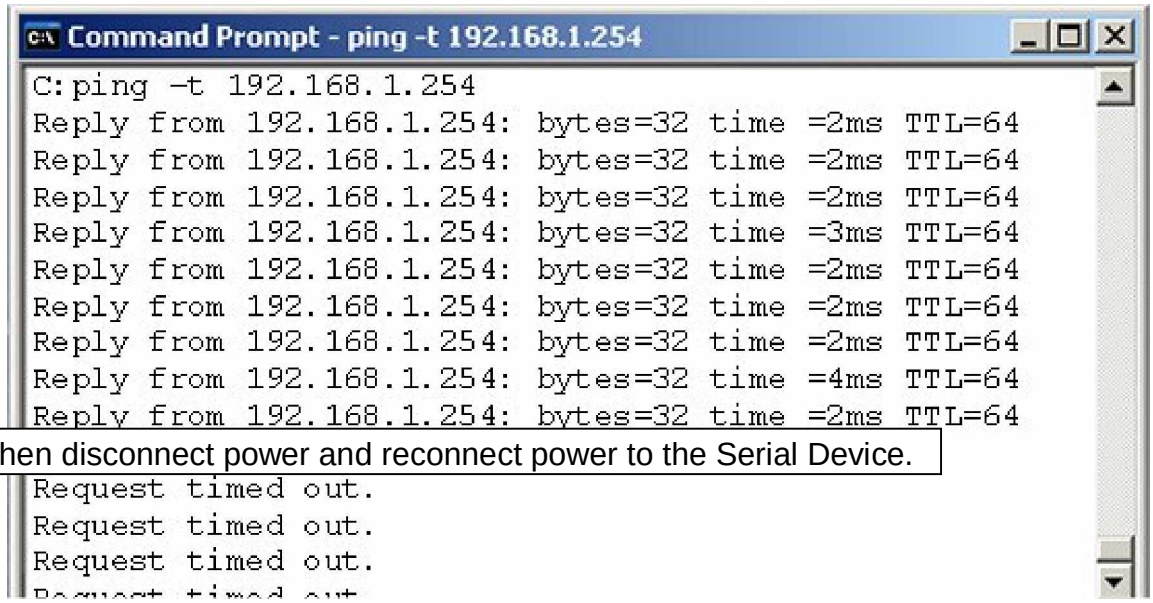
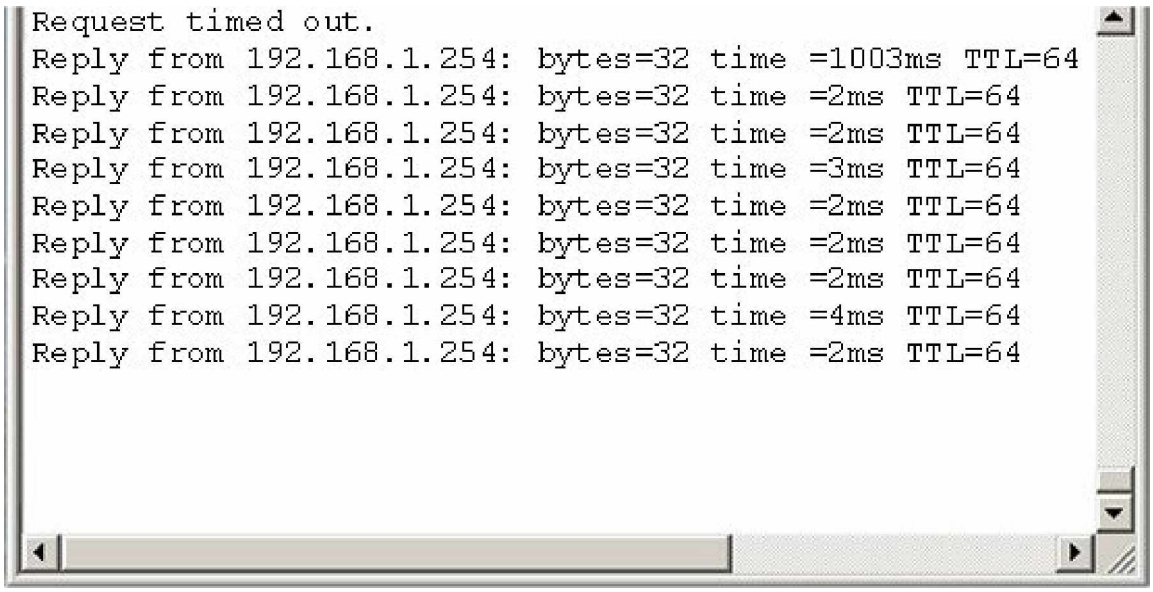
10 FAQ : Frequently Asked Questions

Q: I disconnected power to the Serial Server and then reconnected power. Why does it take so long to reconnect?

A: An example of this is to set up a “ping” session and the cycle power to the Serial Device. Establish a DOS ping session with the serial Server.


Command Prompt - ping -t 192.168.1.254
C:ping -t 192.168.1.254
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =3ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =4ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Then disconnect power and reconnect power to the Serial Device.
Request timed out.
Request timed out.
Request timed out.

10 minutes elapse until the Serial Device reconnects with the active Ping Session.


Request timed out.
Reply from 192.168.1.254: bytes=32 time =1003ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =3ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64
Reply from 192.168.1.254: bytes=32 time =4ms TTL=64
Reply from 192.168.1.254: bytes=32 time =2ms TTL=64

The existing ping session take so long to reconnect with the re-powered Serial device because the Ping Session still is active and it has a memory of the current session with the Serial Device MAC and the temporary randomly generated BSSID number that was formed

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when the Serial Device was originally powered up. But now you have de-powered and then powered up the Serial Device again, and the MAC number is still the same, but now the Serial Device has a **new randomly generated BSSID number** that is **not the same as the previous BSSID that the Ping Session remembers**. So the Ping Session is still trying to connect with the Serial Device settings it remembers from the previous session.
To speed up reconnection after a power down, you should clear the existing connection session (in this example type CTRL-C to stop the Ping Session). Now the AP must be allowed time to clear out its memory of this session (about 3 minutes, typically) and then a new Ping Session can be started to the Serial Device with its new random BSSID value.

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11. Specification

11.1 Technical Specifications

Standards	IEEE 802.11, IEEE 802.11b, IEEE 802.11g
Channels	11 channels (U.S., Canada), 13 channels (Europe), 14 channels (Japan), 2 channels (Spain), 4 channels (France)
Modulation	CCK (11 b), BPSK, QPSK, 16~QAM, 64-QAM (11 g)
Antenna	2 dBi
Transmission Range	Outdoor: 100~300 M, Indoor: 30~100 M
Transmission Rate	11b: 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps
	11g: 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 54 Mbps
Frequency Band	2.400~2.4835 GHz (subject to local regulations)
Security	WEP, WPA/PSK
WEP	64 and 128 bit encryption
Output Power	15 dBm (Typical)
Interface	USB, RS 232
Receive Sensitivity	(Typ. @BER 10E-2): -65 dBm @ 54Mbps
Compatibility	Windows 95/98/2000/ME/XP
EMC Certification	FCC Class B, CE

11.2 Environmental Information

Size (WxDxH)	119 x 84 x 30 (mm), 4.3 x 3.3 x 1 (inch)
Weight	3.8 kg / 5.0 kg (105.8 oz / 141 oz)
Operating Temperature	0°C to 40°C (32°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	20% to 85% relative humidity, non-condensing
Storage Humidity	20% to 90% relative humidity, non-condensing
Power	+5VDC to +30VDC 500mA

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Warranty Statement

We provide this limited warranty for its product only to the person or entity that originally purchased the product from us or its authorized reseller or distributor. We guarantee that equipment is free from physical defects in workmanship and material under normal use from the date of original retail purchase of the Hardware. If the product proves defective during this warranty period, call our Customer Service in order to obtain a Return Authorization number. Be sure to have a proof of purchase on hand when calling. Return requests cannot be processed without proof of purchase. When returning a product, mark the Return Authorization Number clearly on the package pack and include your original proof of purchase. All customers shall be held responsible for shipping and handling charges.

In no event shall our liability exceed the price paid for the product from direct, incidental or consequential damage resulting from the use of the product, its accompanying software, or its documentation. We make no warranty or representation, expressed, implied, or statutory, with respect to its products or the contents or use of this documentation and all accompanying software, and specifically disclaim its quality, performance, merchantability, or fitness for any particular purpose. We reserve the right to revise or update its products, software, or documentation without obligation to notify any individual or entity.